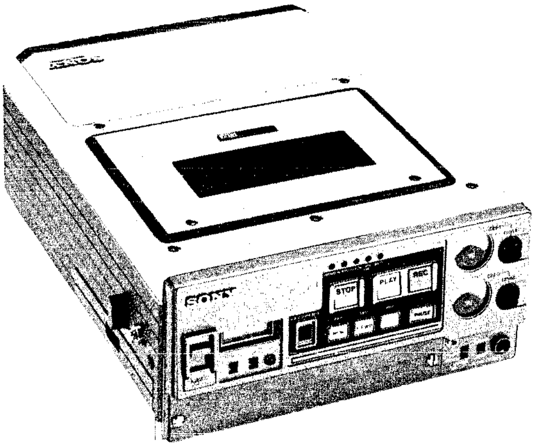
SONY

PORTABLE VIDEOCASSETTE RECORDER

BVU-150P



Professional U-matic S SP

OPERATION AND MAINTENANCE MANUAL

1st Edition (Revised 2)

Serial No. 10001 and Higher

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(This section will be available at a later date.)

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(This section will be available at a later date.)

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(This section will be available at a later date.)

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SECTION 1
OPERATION

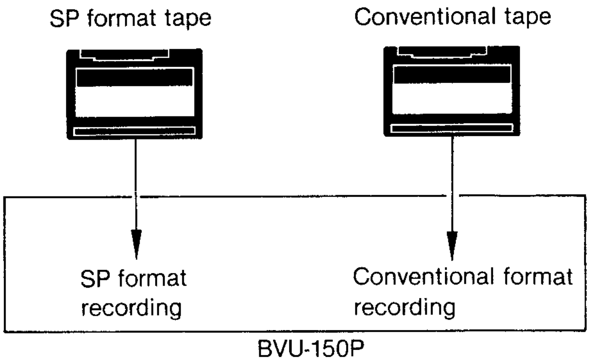
1-1. FEATURES

1-1-1. New Format

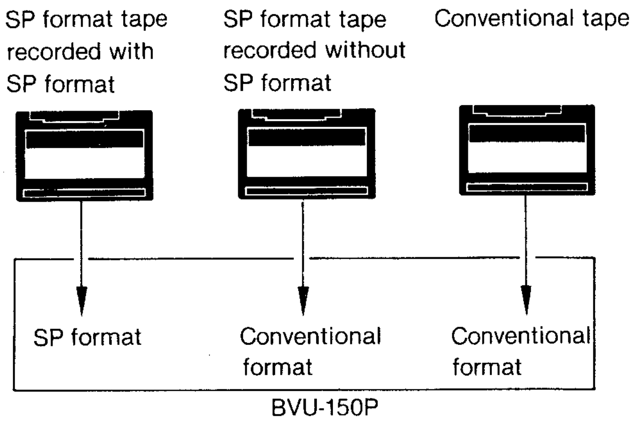
Newly developed SP (Super Performance) format
The new SP format raises the Y-carrier by 0.8 MHz, thus creating a wider bandwidth, and consequently, a higher quality picture. A new high-grade tape is available to make the best use of the SP format, this is called SP format tape. When a new SP format cassette is inserted, recording is automatically made in the new SP format.

Interchangeability between new SP format and conventional recording format
The BVU-150P can use both the new SP format tape and the conventional U-matic tape, and can employ both SP format and conventional format recording/playback respectively. The SP/conventional mode circuit automatically detects the recording format to be used, or the format of the already recorded tape for playback. Conventional KCS tape automatically uses the conventional format while new KSP-S tape automatically uses the SP format.

Recording



Playback


SP format tape recorded with SP format
SP format tape recorded without SP format
Conventional tape
SP format
Conventional format
Conventional format
BVU-150P

1-1-2. Devices for Reliable Camera Recording

Video confidence
The simultaneous playback picture (the picture which has just been recorded) can be monitored on the camera viewfinder if a camera equipped with a return video button is connected to the CAMERA connector. You can check whether or not the recording has been made correctly.

Protection against accidental recording interruption
If the KEY INHIBIT button is set to ON, only the EJECT button can function. All other buttons are disabled so that the recording will not be interrupted accidentally.
Also, all buttons, except the STOP and EJECT buttons, are disabled during video recording.

Warning system
The warning lamps blink or light to tell the operator at a glance that the auto shut-off mechanism is functioning due to end of tape, low battery charge, etc. An audible alarm will sound simultaneously through the earphone. When a camera equipped with a Sony Q type (14-pin) connector is used, the warning lamps in the viewfinder will blink in unison with the warning lamps on the recorder.

Tape remaining time indication
The tape time remaining can be checked on the camera viewfinder screen if a camera equipped with a return video button is used.

1-1-3. Editing Capability

Quick servo system
Video cassette programs can be composed shot-by-shot without any irregularities at scene changes because the quick playback servo system guarantees a clean cut every time.

Audio dubbing
Audio (commentary, music, etc.) can be added to a previously recorded video recording.

1-1-4. Audio

High quality audio signal recording
The sendust audio head permits high quality audio recording with good high frequency response.

Audio noise reduction system with auto Dolby detector
The BVU-150P employs a Dolby NR* system to reduce tape noise. The Dolby NR audio noise reduction system can be switched on or off as desired during recording and playback.

* "Dolby" and the double-D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

Automatic or manual audio recording
While recording, the audio level can be controlled manually (recording with a limiter) or automatically.

1-1-5. Other Features

Portability and versatility
The lightweight, compact BVU-150P is designed for portable use. It may be operated in either the vertical or horizontal position. The recorder is free of gyroscopic distortion.

Time code recording/playback function
It is possible to record and playback the EBU time code on the address track.
The BKU-150P time code generator is optionally available for time code recording.

Picture search
Pictures can be monitored during the rewind and fast forward modes, permitting high-speed search.

External sync system
The recorder will operate with an external sync system when the video signal is connected to the VIDEO IN connector during playback.

Logic control
The logic control system allows you to change modes without pressing the STOP button.

Time base corrector (TBC) connection facility
The unit is provided with SC IN and RF (OFF TAPE) connectors to allow a TBC to be connected.

1-2. PRECAUTIONS

On safety

- Operate the unit on 12 V dc.

On installation
Keep the unit away from strong magnetic fields, high temperature and excessive dust and moisture.

On operation

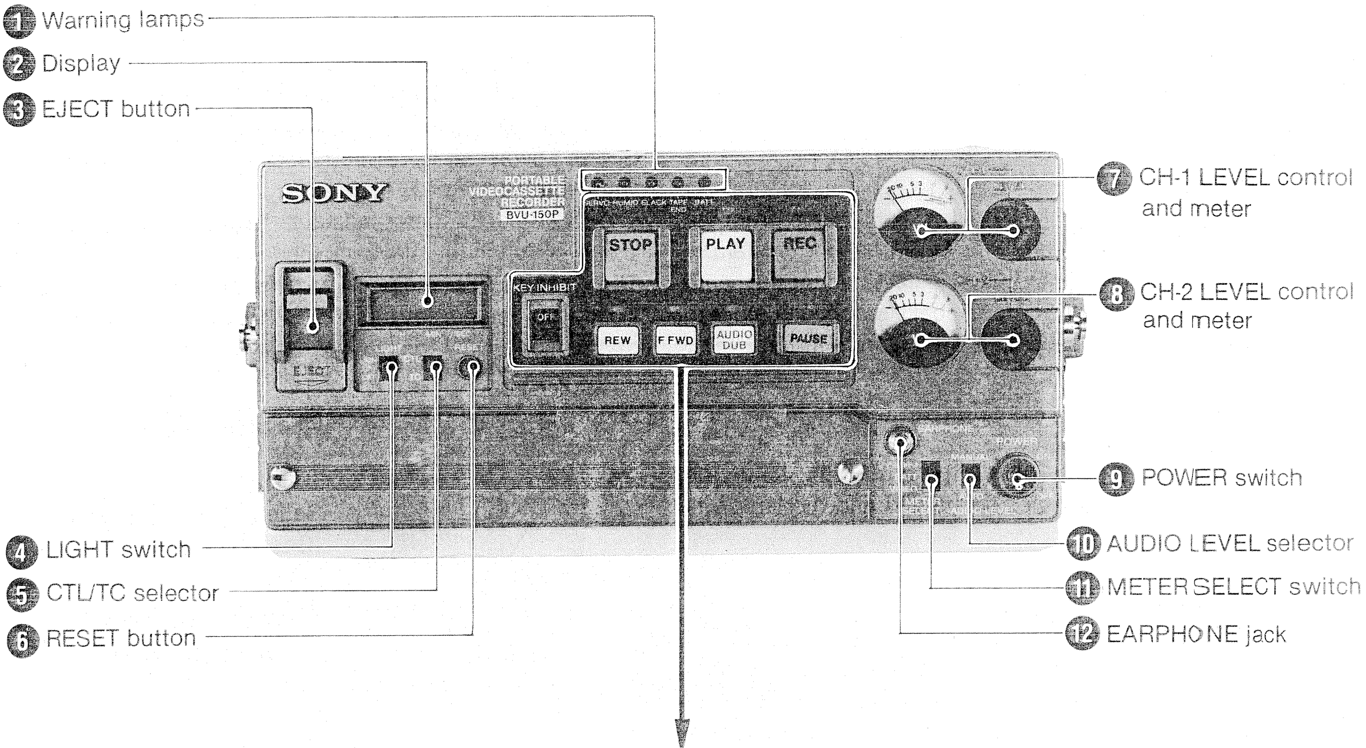
- Avoid subjecting the unit to unnecessary shock or impact.
- Never operate the unit right after having transported it from a cold location directly to a warm location.

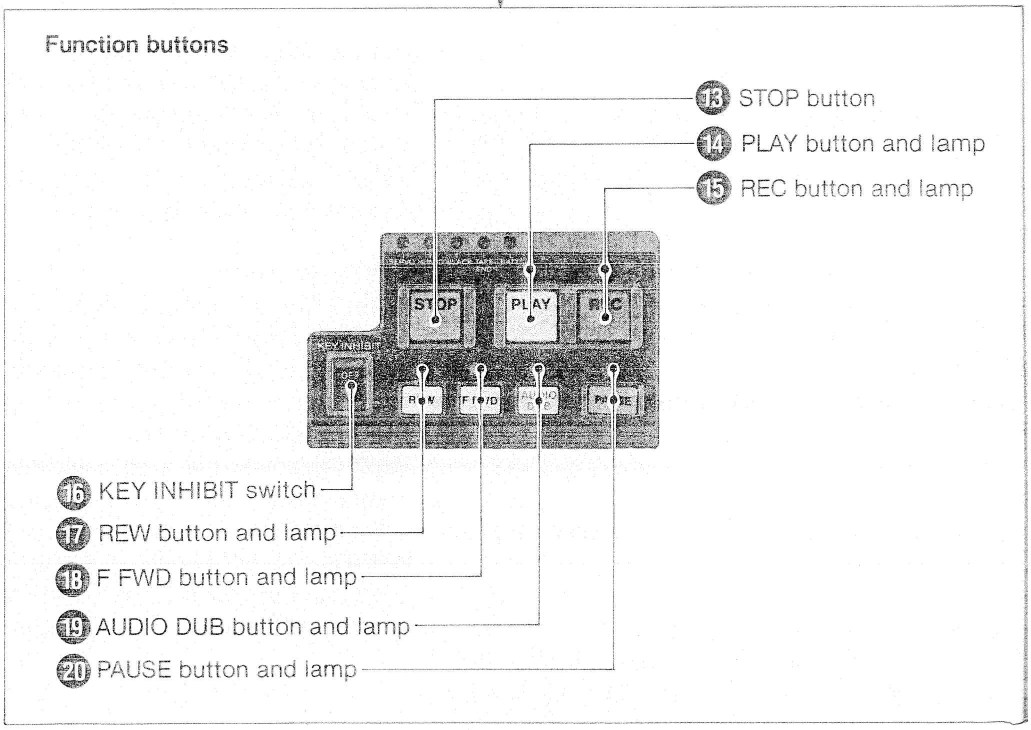
On transportation
Save the carton and associated packing material. These will be useful to transport or ship the recorder.

If you have any questions about this unit, contact your authorized Sony representative.

1-3. LOCATION AND FUNCTION OF PARTS AND CONTROLS

1-3-1. Control Panel





Function buttons

❶ Warning lamps
These lamps blink or light to alarm the operating status of the unit.

SERVO lamp
Blinks when the drum servo and capstan servo are not locked.

HUMID lamp
Lights when condensation has formed on the head drum or when the humidity is very high.

SLACK lamp
Blinks when the tape is slack on the take-up side (from the capstan to the take-up reel) of the tape transport system or when the stop of the drum rotation is detected. At the same time, the tape transport is automatically stopped in order to prevent the tape from becoming entangled in the transport system.

TAPE END lamp
Blinks about 1.5 minutes before the end of the tape. The tape will stop when it comes to the end and the lamp will stay lit.

BATT lamp
Blink when the voltage supplied by the internal BP-90 battery pack falls below 11.3 V, indicating that the batteries are almost exhausted. The lamp lights up steadily when the voltage falls to 11 V, and the tape transport is automatically stopped.

❷ Display
When the CTL/TC selector ❺ is set to CTL, the CTL signals are detected and displayed in minutes and seconds. The "−" symbol is displayed when the tape is rewound beyond "00:00".
When the CTL/TC selector is set to TC and the optional BKU-150P time code generator is connected, the time code is displayed in hours, minutes and seconds.

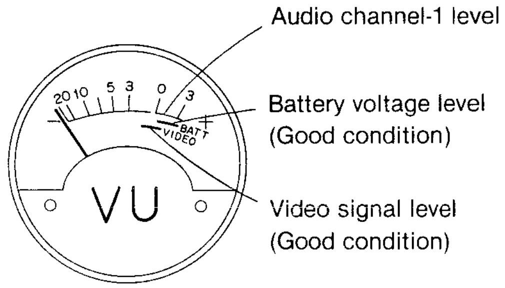
❸ EJECT button
Press to raise the cassette compartment to load or remove a cassette.

❹ LIGHT switch
Set to ON to illuminate the display and VU meters. Set to OFF to turn them off.

❺ CTL/TC selector
Select the data of the display ❷; CTL (control signal) or TC (time code). If the BKU-150P optional time code generator is not connected, the CTL count will be displayed even if the selector is set to TC.

❻ RESET button
Press to reset the CTL time count of the display ❷ to "00:00". The time code is also reset to "00:00:00" when the F-RUN/R-RUN selector on the connected BKU-150P time code generator (optional) is set to R-RUN (record-run). This button does not function when the F-RUN/R-RUN selector is set to F-RUN (free-run).

❼ CH-1 LEVEL control and meter
To adjust the audio channel 1 recording level manually, set the AUDIO LEVEL selector ❿ to MANUAL and the METER SELECT switch ⓫ to CH-1 and then adjust the control while watching the meter.
The CH-1 LEVEL meter indicates the audio channel 1 output level during the playback mode.
The CH-1 LEVEL meter is also used as the battery and video level meter. Set the METER SELECT switch to BATT (battery) or VIDEO to check each level.


Audio channel-1 level
20 10 5 3 0 3
BATT
VIDEO
VU
Battery voltage level (Good condition)
Video signal level (Good condition)

❽ CH-2 LEVEL control and meter
To adjust the audio channel 2 recording level manually, set the AUDIO LEVEL selector ❿ to MANUAL and adjust the control while watching the meter.
The CH-2 LEVEL meter indicates the audio channel 2 output level during the playback mode.

❾ POWER switch
Set to ON to turn on the recorder. A number will appear on the time counter. Power will be supplied to the camera, if connected to the CAMERA connector.

❿ AUDIO LEVEL selector
AUTO: To adjust the audio recording level automatically, set to this position. The automatic gain control regulates the audio levels to assure optimum recording.
MANUAL: To adjust the audio recording level manually, set to this position. The audio limiter circuitry will be activated to minimize audio distortion at the peaks.

⑪ **METER SELECT switch**

Select the display mode of the CH-1 LEVEL meter ⑦:

CH-1: Audio channel 1 recording/playback level
BATT: Battery voltage
VIDEO: Video recording level

⑫ **EARPHONE jack** (mini jack)

The audio signal being recorded or played back can be monitored by connecting an 8-ohm earphone to this jack. The MONITOR selector on the connector panel is used to select the channel: CH-1, CH-2 or MIX. If any of the warning lamps is blinking, a beep will sound in the earphone.

⑬ **STOP button**

Press to stop the unit's operation.

⑭ **PLAY (playback) button and lamp**

Press to play back the tape. To begin a recording, press this button while pressing the REC button.

⑮ **REC (record) button and lamp**

For recording, press the PLAY button while pressing this button. While recording, the lamp will blink.

If only this button is pressed in the stop mode, the E-to-E mode picture* will be displayed on the video monitor or the camera's viewfinder. Adjust the audio level and allow time for the camera to warm up by setting the recorder in the E-to-E mode.

During the fast forward, rewind or the playback mode, the E-to-E mode picture can be monitored while this button is pressed.

* **E-to-E (Electronics to Electronics) picture**

The input video signal which has passed through the recorder's video electronics is displayed on the video monitor or in the camera's viewfinder. This is the E-to-E mode picture.

⑯ **KEY INHIBIT switch**

Set to ON to deactivate all the buttons (except the EJECT button) on the unit so that recording will not be accidentally interrupted.

⑰ **REW (rewind) button and lamp**

Press to rewind the tape; the lamp lights. The high-speed playback picture with guard band noise can be seen during rewinding (picture search). When the tape is completely rewound, the unit automatically goes into the stop mode.

⑱ **F FWD (fast forward) button and lamp**

Press to advance the tape rapidly; the lamp lights. The high-speed playback picture with guard band noise can be seen during fast forward mode (picture search). When the tape is completely wound, the unit automatically goes into the stop mode.

⑲ **AUDIO DUB button and lamp**

When this button only is pressed, the unit is set to audio channel 1 E-to-E mode. Audio recording level adjustments can be made before starting audio dubbing.

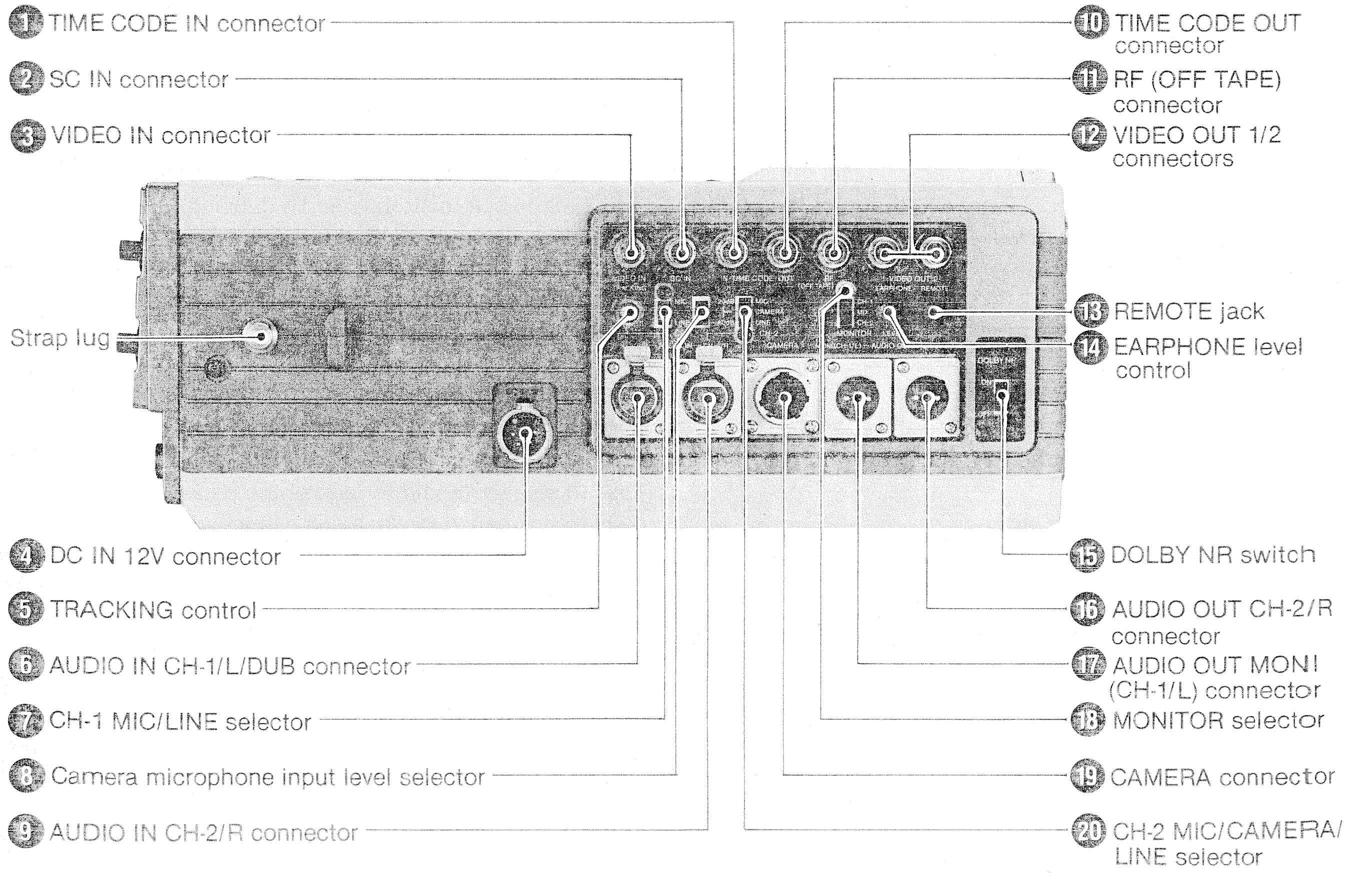
For audio dubbing, press this button together with the PLAY button. It is possible to record audio on channel 1 only, without disturbing previously recorded video and audio channel 2 signals.

⑳ **PAUSE button and lamp**

Press to momentarily stop the tape in the record or playback mode. The lamp will blink during the pause mode. Press this button again to release the pause mode. During the playback pause mode, a still picture will be displayed.

- After about 8 minutes in the pause mode, the tape protection mechanism will activate and the tape tension will be released. To restore the previous mode, press the PAUSE button again.
  During the tape protection mechanism activates, E-to-E mode picture or a still picture will be disengaged and no picture can be seen on the monitor screen. At the portion where the tape protection mechanism activates, the picture will be disturbed.

1-3-2. Connector Panel



① TIME CODE IN connector
② SC IN connector
③ VIDEO IN connector
Strap lug
④ DC IN 12V connector
⑤ TRACKING control
⑥ AUDIO IN CH-1/L/DUB connector
⑦ CH-1 MIC/LINE selector
⑧ Camera microphone input level selector
⑨ AUDIO IN CH-2/R connector
⑩ TIME CODE OUT connector
⑪ RF (OFF TAPE) connector
⑫ VIDEO OUT 1/2 connectors
⑬ REMOTE jack
⑭ EARPHONE level control
⑮ DOLBY NR switch
⑯ AUDIO OUT CH-2/R connector
⑰ AUDIO OUT MONI (CH-1/L) connector
⑱ MONITOR selector
⑲ CAMERA connector
⑳ CH-2 MIC/CAMERA/LINE selector

① **TIME CODE IN (input) connector** (BNC type)
Connect to the time code output connector on the time code generator or another VTR for recording the time code signal.

② **SC IN (subcarrier input) connector** (BNC type)
Accepts an external subcarrier frequency (4.43 MHz) to drive the playback chrominance signal. Connect to a time base corrector.

③ **VIDEO IN (input) connector** (BNC type)
Composite video input. Nothing should be connected to the CAMERA connector ⑲ when a signal input to this connector is to be recorded.

④ **DC IN (input) 12V connector** (XLR, 4-pin)
Connect to a 12V dc power supply, such as a Sony AC-500CE ac power adaptor.

⑤ **TRACKING control**
To correct tracking deviation when playing back tapes recorded on other machines, adjust this control. Normally, set to the center detent position. The control has no effect in record.

⑥ **AUDIO IN CH-1/L/DUB connector** (XLR, 3-pin)
Connect a microphone or an audio line input source for the recording of audio channel 1 or for audio dubbing. The audio signal level must be selected with the CH-1 MIC/LINE selector ⑦.

⑦ **CH-1 MIC/LINE selector**
Depending on the audio source used for the AUDIO IN CH-1/L/DUB connector ⑥, select the appropriate position.

MIC: For microphone.

LINE: For other audio inputs.

❽ Camera microphone input level selector
Depending on the microphone level of the camera connected to the CAMERA connector ⓳, select the appropriate position: −20 dB or −60 dB.
If a microphone is connected to the AUDIO IN CH-1/L/DUB ❻ or the AUDIO IN CH-2/R connector ❾, the setting of this selector is not required.

Setting examples

Camera used	Selector setting
BVP-300AP	−60 dB
BVP-330P	−60 dB
BVP-150P	Either position according to the camera microphone level setting
DXC-1800 series	−60 dB
DXC-1820 series	−60 dB
DXC-M3 series	−60 dB
DXC-M3A series	Either position according to the camera microphone level setting

❾ AUDIO IN CH-2/R connector (XLR, 3-pin)
Connect a microphone or an audio line input source for the recording of the audio channel 2. The audio signal level must be selected with the CH-2 MIC/CAMERA/LINE selector ⓴.

❿ TIME CODE OUT (output) connector (BNC type)
The time code signal generated by the connected BKU-150P time code generator (optional) or the played back time code signal is supplied. Connect to the time code input connector of a time code reader or another VTR.

⓫ RF (OFF TAPE) connector (BNC type)
Supplies the undemodulated FM signal. An external dropout compensator (DOC) can be connected to compensate for dropouts.

⓬ VIDEO OUT (output) 1/2 connectors (BNC type)
Composite video outputs. For connection to the video input of a video monitor, VTR or a time base corrector.

⓭ REMOTE jack (special mini jack)
Connect the RM-680 remote control unit (optional).

⓮ EARPHONE level control
Adjust the earphone level with this control.

⓯ DOLBY NR switch
Selects the audio recording and playback system.
ON: To record and play back using the Dolby NR* system. The Dolby NR system is actuated for both channels 1 and 2 simultaneously. To activate the Dolby NR system for channel 1 or 2 independently, refer to Section 2.
OFF: To record and play back without the Dolby NR system.

*With the Dolby NR system, low-level, high-frequency signals which tend to be obscured by tape hiss, are boosted so that they are substantially higher in level than any tape noise. When these signals are played back, the level is lowered to the original input level, while simultaneously the level of any tape noise is reduced to the same extent.

⓰ AUDIO OUT CH-2/R connector (XLR, 3-pin)
The audio signal of channel 2 is output from this connector.

⓱ AUDIO OUT MONI (CH-1/L) connector (XLR, 3-pin)
The audio signal selected by the MONITOR selector ⓲ is supplied from this connector.

⓲ MONITOR selector
Select the audio outputs from the AUDIO OUT MONI (CH-1/L) connector ⓱ or the EARPHONE jack (on the control panel).
CH-1: Audio output of channel 1
MIX: Mixed audio output of channels 1 and 2
CH-2: Audio output of channel 2

⓳ CAMERA connector (Q type, 14-pin)
Connect the output signal of a Sony color video camera. Nothing should be connected to the VIDEO IN connector ❸ when a signal input to this connector is to be recorded.

⓴ CH-2 MIC/CAMERA/LINE selector
Depending on the audio source supplied to the AUDIO IN CH-2/R connector ❾, select the appropriate position.
MIC: For microphone.
CAMERA: For the audio input supplied to the CAMERA connector ⓳.
LINE: For other audio inputs.

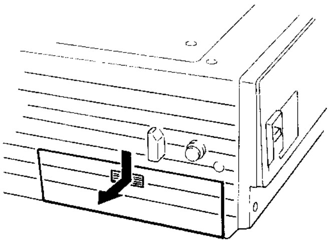
1-4. POWER SOURCES

The BVU-150P video cassette recorder can operate either from a BP-90 rechargeable battery pack (optional) or from an ac power source using an AC-500CE ac power adaptor (optional).

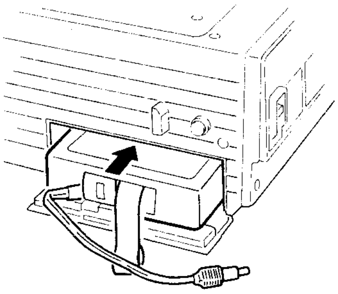
1-4-1. Battery

Installation

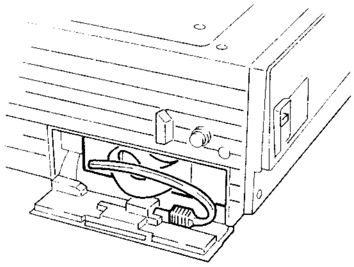
1 Push down to open.



2 Insert a BP-90 as illustrated.



3 Connect the plug.



4 Close the cover.

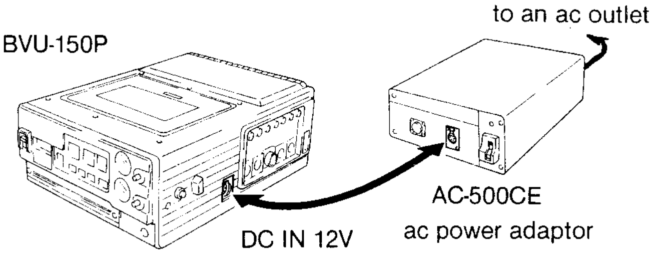
Battery life

The BVU-150P, when used together with the BVP-330AP color camera and a fully charged battery pack, will operate continuously under normal temperatures for approximately 1 hour. When the VTR only is operated, operation lasts about 2 hours.

Battery charging

After every use, charge the battery by using a battery charger such as the BC-210CE. For details on recharging, refer to the instructions supplied with the battery charger.

1-4-2. AC Operation



Notes

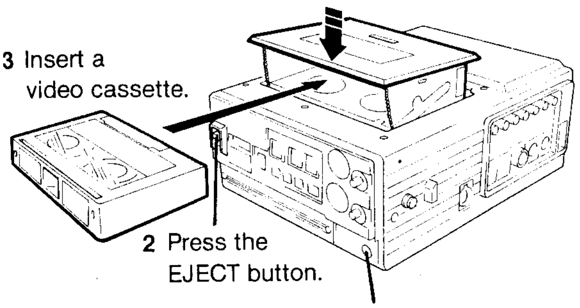
- When the ac power adaptor is connected to the DC IN 12V connector, the power supply from the internal battery is automatically disconnected.
- Do not plug in the cord or unplug it from the DC IN 12V connector of the recorder during battery operation, because this may cause tape slack.

1-5. VIDEO CASSETTE HANDLING

1-5-1. Cassette Insertion

Usable cassette

3/4-inch cassette, such as KSP-S, KCS or equivalent



4 Push down the lid until it locks.

3 Insert a video cassette.

2 Press the EJECT button.

1 Set the POWER switch to ON.

Note

If the HUMID lamp lights when the POWER switch is set to ON, the moisture has condensed inside the machine. If this happens, do not insert a cassette. Turn off the power and wait until the HUMID lamp does not light when the power is turned on.

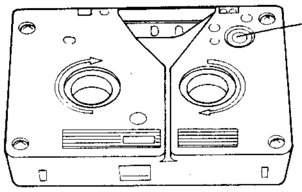
To remove

Make certain that the recorder is turned on, and press the EJECT button.

1-5-2. Safety Cap on the Bottom of the Cassette

Video cassette🅂 incorporates a convenient safety device to prevent accidental erasure.

To safeguard the material recorded on a cassette, remove the red cap on the bottom of the cassette. To record on this cassette later, replace the cap.



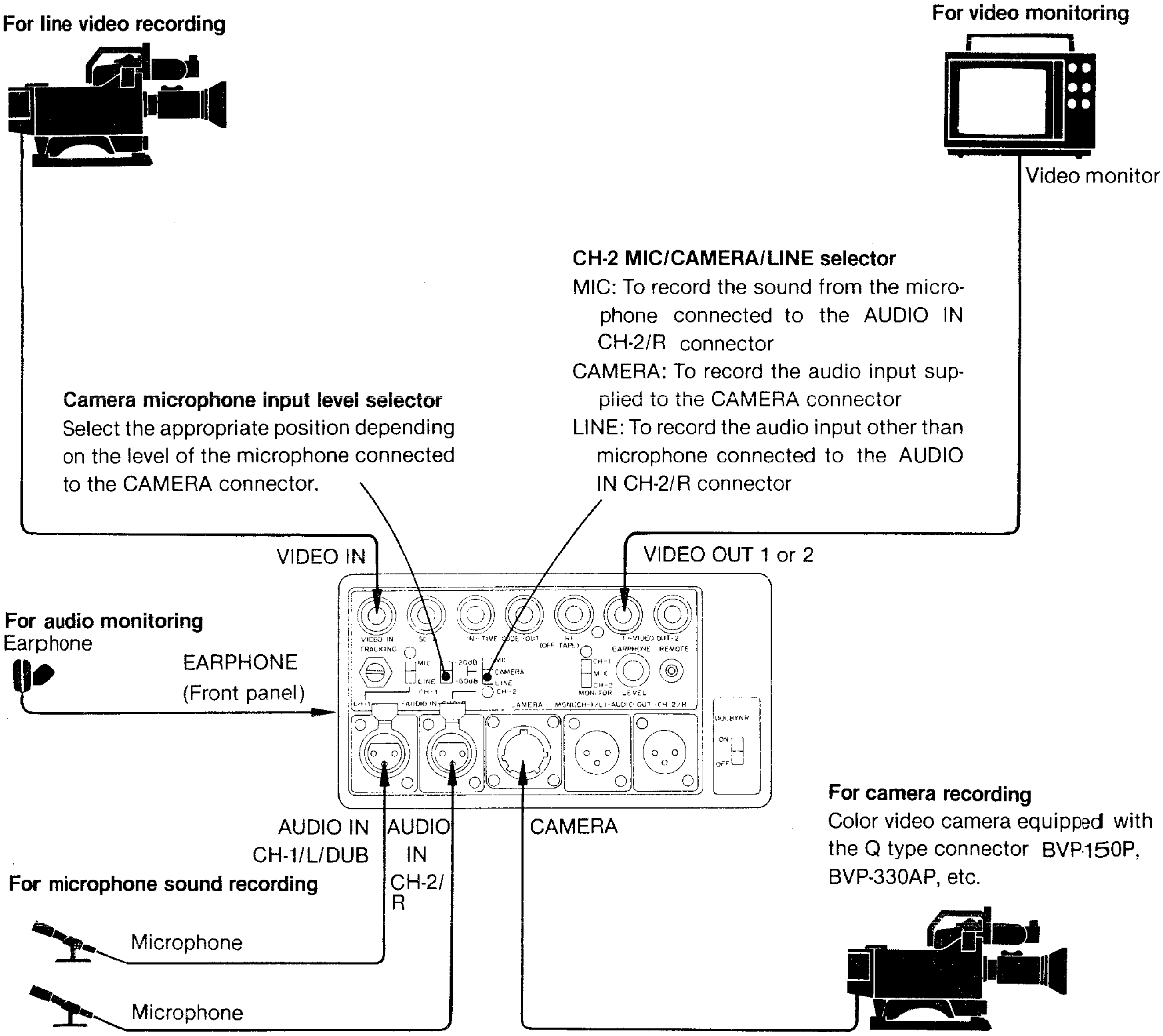
1-5-3. Notes on Cassette Handling and Storage

- Always store the video cassette 🅂 in the cassette case when it is to be carried or mailed.
- Store the cassette in the cassette case vertically, after first rewinding the tape evenly on the supply reel.
- Do not store a video cassette in a place subject to direct sunlight, high humidity, excessive dust, near heat sources such as radiators or air ducts, or magnetic field.
- Avoid subjecting the cassette to mechanical shock.

1-6. RECORDING

1-6-1. Camera Recording

Connections



CH-2 MIC/CAMERA/LINE selector

MIC: To record the sound from the microphone connected to the AUDIO IN CH-2/R connector

CAMERA: To record the audio input supplied to the CAMERA connector

LINE: To record the audio input other than microphone connected to the AUDIO IN CH-2/R connector

Camera microphone input level selector

Select the appropriate position depending on the level of the microphone connected to the CAMERA connector.

For camera recording

Color video camera equipped with the Q type connector BVP-150P, BVP-330AP, etc.

Note

Connect the signal to either of the CAMERA or VIDEO IN connector. If the signals are connected to both connectors, recording cannot be correctly made.

Preparation

Make the necessary connections and supply video and audio input signals.

Video input level

This VTR contains a sync AGC circuit and so there is no need to adjust the video input level. To check the video level, set the METER SELECT switch to VIDEO and check that the meter pointer of the CH-1 LEVEL meter is in the blue zone.

Audio recording level

For automatic adjustment: Set the AUDIO LEVEL selector to AUTO.

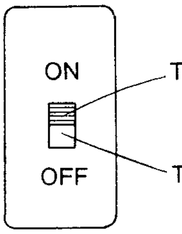
For manual adjustment:

1. Press the REC button to set the VTR in the E-to-E mode.
2. Set the AUDIO LEVEL selector to MANUAL.
3. For audio channel 1 adjustment, set the METER SELECT switch to CH-1.
4. Adjust audio channel 1 or 2 recording level by turning the CH-1 or CH-2 LEVEL control, so that the pointer of the level meter swings up to 0 VU at its maximum deflection.

Audio recording with the Dolby NR system

Audio signals can be recorded with or without the Dolby NR system by setting the DOLBY NR switch on the connector panel.

DOLBY NR

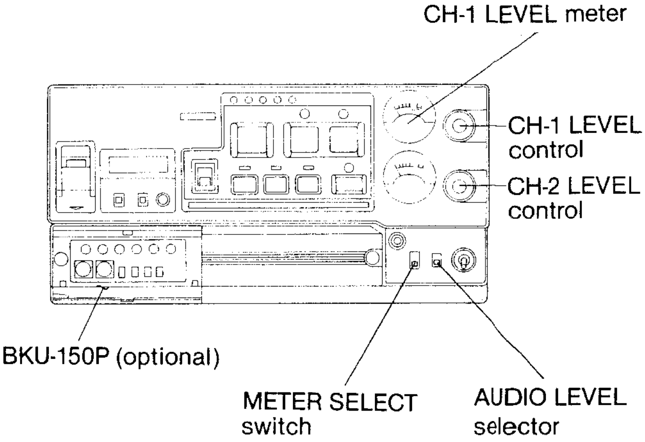


The Dolby NR system is activated.

The Dolby NR system is deactivated.

Time code

If the optional BKU-150P time code generator is connected to the unit, the time code (LTC, VITC and user bits) can be recorded on the tape. For details on how to set the time code, refer to the instruction manual furnished with the BKU-150P.



Operation (with a camera connected to the CAMERA connector)

1 Insert a video cassette.
Make certain that the red cap is in place on the bottom of the video cassette.

↓

2 While pressing the REC button, press the PLAY button. The recorder will be in the recording standby mode.

↓

3 Start recording by pressing the VTR start/stop button on the camera or the PAUSE button on the recorder.

↓

At the end of the recording, press the STOP button on the recorder.

Pause operation during camera recording

To stop the tape momentarily during camera recording, press the VTR start/stop button on the camera or the PAUSE button on the recorder. The PAUSE lamp on the recorder will blink during the pause mode. The E-to-E mode signal will remain displayed on the monitor connected to the recorder.

To release the pause mode, press the VTR start/stop button on the camera again or the PAUSE button on the recorder.

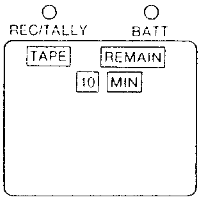
- If the recording has been started with the VTR start/stop button on the camera, it can only be stopped with the VTR start/stop button. The PAUSE button on the recorder cannot stop recording.
  If the recording has been started with the PAUSE button on the recorder, it can be stopped with the PAUSE button and also with the VTR start/stop button on the camera.
- After about 8 minutes of pause mode, the tape protection mechanism will activate and the tape tension will be automatically released. To restore the record mode, press the PAUSE button on the recorder or the VTR start/stop button on the camera. Smooth transition cannot be realized at the point where the tape protection mechanism activates.

Recording stop inhibit

To prevent the recording from being accidentally interrupted by mis-operation of any keys, the INHIBIT switch is provided. When the INHIBIT switch is set to ON, all keys, except the EJECT button, are deactivated. To activate the keys, reset the INHIBIT switch to OFF.

Tape remaining time indication

During recording, while the return video button on the camera is pressed, the tape time remaining is displayed on the simultaneous playback picture.



Indication	15 MIN	10 MIN	5 MIN	4 MIN	3 MIN	2 MIN	1 MIN	TAPE BEFORE END *
Tape remaining time	20	15	10	5	4	3	2	1.5 0

min.

* The indication disappears.

To check the video signal being recorded (simultaneous playback picture)

To check whether or not the camera recording is correctly made, press the return video button on the camera. While the return video button is pressed, a simultaneous playback picture is displayed on the viewfinder screen, with the tape remaining time indication.

If the tape does not run in the record mode

The tape will not run if a video signal is not supplied. If this happens, check the pointer of the CH-1 LEVEL meter. When the METER SELECT switch is set to VIDEO, it should be in the blue zone, indicating a sufficiently strong video signal.

Line video recording (with a camera or other video source connected to the VIDEO IN connector)

1 Insert a video cassette.
Make certain that the red cap is in place on the bottom of the video cassette.

2 Start recording by pressing the PLAY button while pressing the REC button.

3 To stop recording momentarily, press the PAUSE button on the recorder. To release the pause mode, press the PAUSE button again.

At the end of the recording, press the STOP button on the recorder.

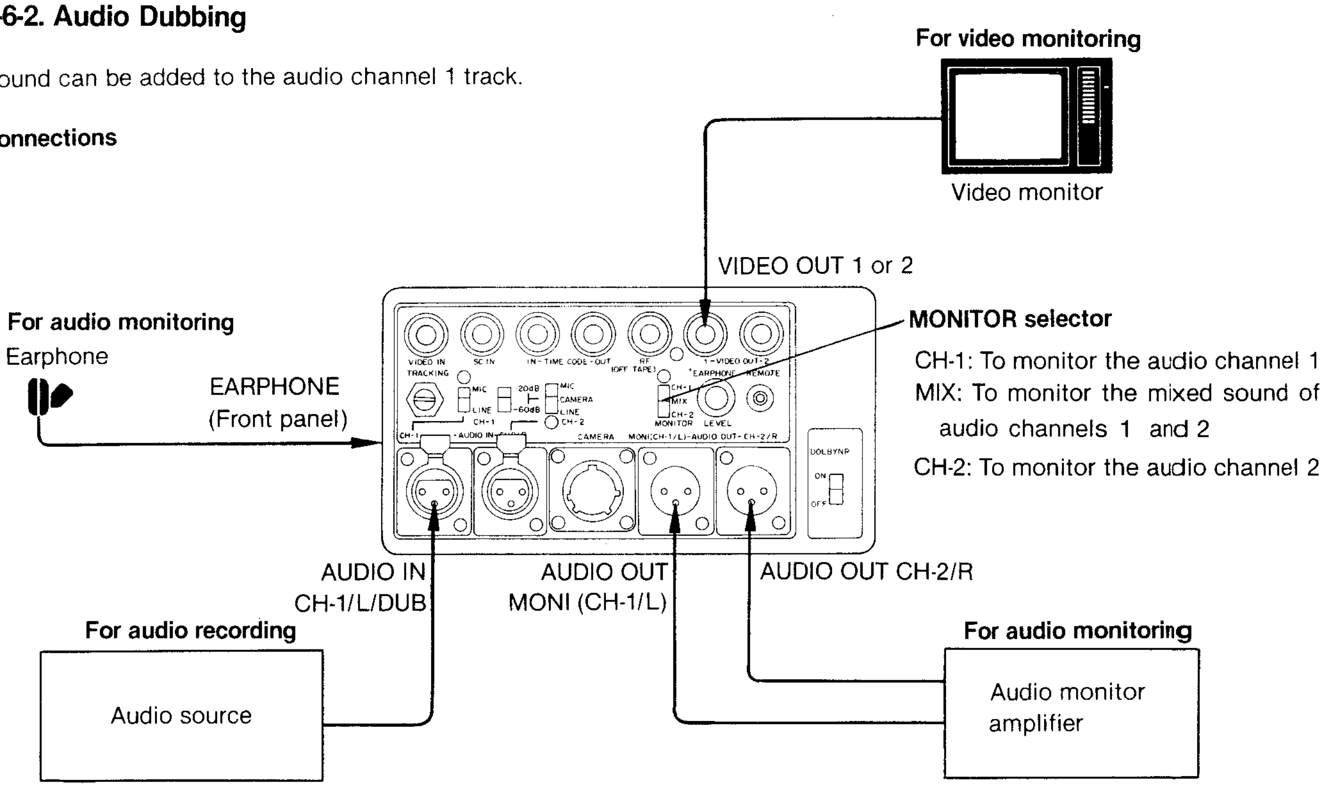
NOTES

- The VTR start/stop button on the camera does not function.
- Tape remaining time indication and simultaneous playback picture by the return video button on the camera are not available.

1-6-2. Audio Dubbing

Sound can be added to the audio channel 1 track.

Connections



MONITOR selector

CH-1: To monitor the audio channel 1

MIX: To monitor the mixed sound of audio channels 1 and 2

CH-2: To monitor the audio channel 2

Operation

1 Insert a video cassette.
Make certain that the red cap is in place on the bottom of the video cassette.

2 Adjust the audio recording level.
For automatic level adjustment
Set the AUDIO LEVEL selector to AUTO.
To adjust manually
1) Set the AUDIO LEVEL selector to MANUAL.
2) Set the METER SELECT switch to CH-1.
3) Press the AUDIO DUB button.
4) Adjust the audio channel 1 recording level by turning the CH-1 LEVEL control, so that the pointer of the level meter swings up to 0 VU at its maximum deflection.

3 Set the DOLBY NR switch on the connector panel to ON if the sound on the audio channel 2 is recorded with the Dolby NR system or if the sound is to be recorded with the Dolby NR system.

4 Play the tape while monitoring the playback picture.

5 When the desired portion is found, press the PAUSE button.

6 Press the AUDIO DUB button.

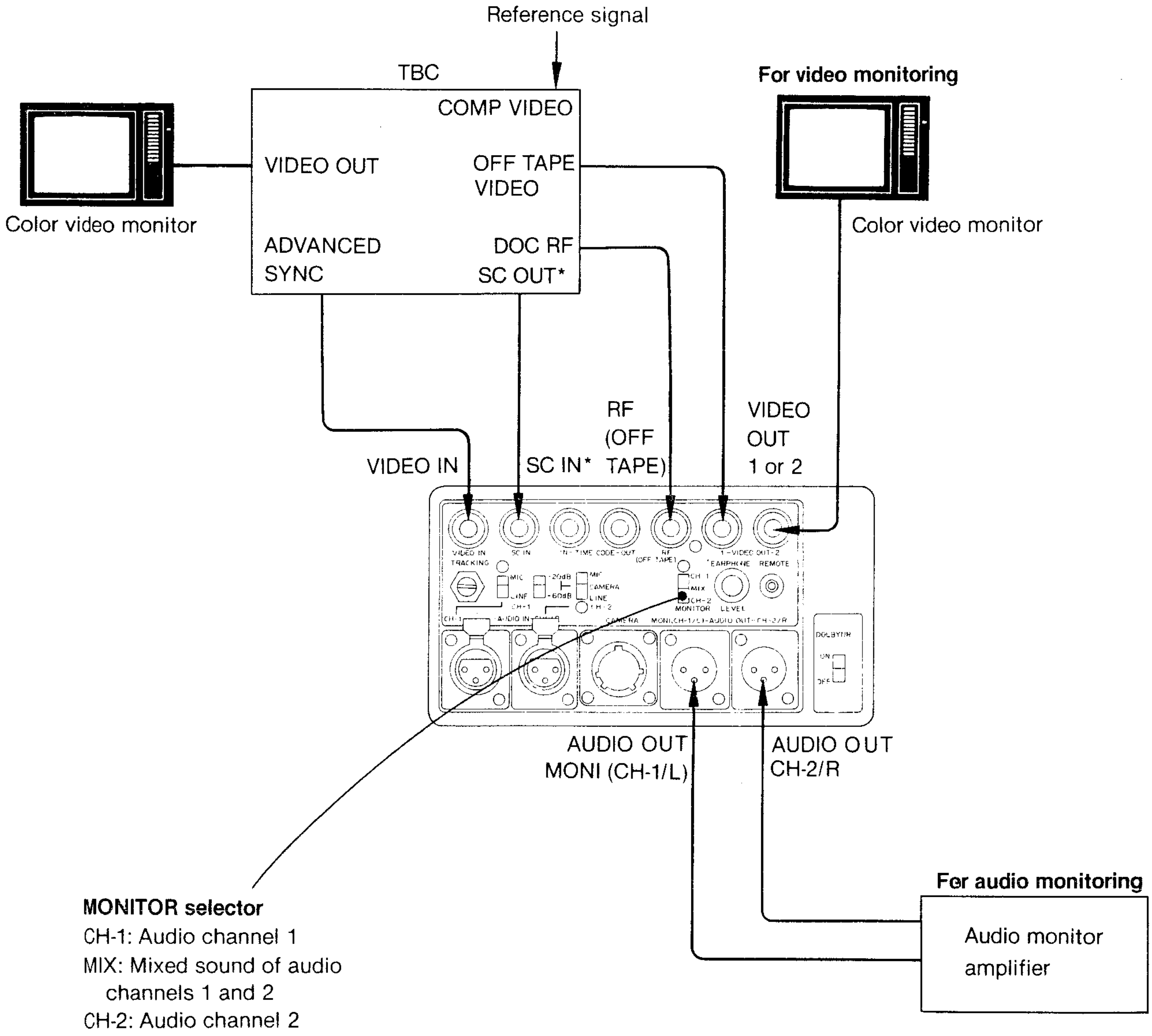
7 Press the PAUSE button again. The pause mode will be released, and audio dubbing will begin.

8 When audio dubbing is completed, press the STOP button.

1-7. PLAYBACK

1-7-1. Connections

Connection with a time base corrector (TBC)



MONITOR selector
CH-1: Audio channel 1
MIX: Mixed sound of audio channels 1 and 2
CH-2: Audio channel 2

*When a TBC which requires the subcarrier input, such as a BVT-2000P, is used, make this connection. For other TBCs, this connection is not required.

1-7-2. Operation

1 Insert a recorded video cassette.

2 Set the DOLBY NR switch to ON if the tape has been recorded with the Dolby NR system.

3 Press the PLAY button; playback will begin.

4 To stop playback, press the STOP button.

Picture search
You can search for a particular picture by pressing either the F FWD or REW button. The picture will be displayed with the guard band noise.

To momentarily stop the playback
Press the PAUSE button. A still picture will be obtained. In some cases, the still picture may lose color or fail to maintain correct hues, depending on the monitor.

- After about 8 minutes of pause mode, the tape protection mechanism will activate and the tape tension will automatically be released. To restore the playback mode, press the PAUSE button.

To adjust tracking
If streaks or snow appears in the playback of tapes recorded on other video cassette recorders, turn the TRACKING control in either direction with a screwdriver until the best possible picture is obtained.
After playback of this particular tape, return the TRACKING control to the center detent position.

Time code reading
When the optional BKU-150P time code generator is connected to this unit and a time code has been recorded on the tape, the time code will be read and displayed on the time counter. The time code read will also be output from the TIME CODE OUT connector.
In the fast forward or the rewind mode, the last time code which was read during the previous playback mode, is held on the time counter. The data of the time counter will be reset to that on the tape when playback restarts.

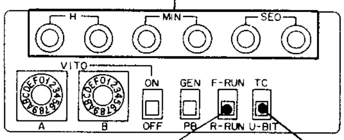
1-8. TIME CODE

By connecting the optional BKU-150P time code generator to this unit, a time code can be generated and recorded on the tape with the video signal.
For details on how to attach the BKU-150P and set the data, refer to the operation manual of the BKU-150P.

1-8-1. Setting the Data

Time data

3 Set the time data.

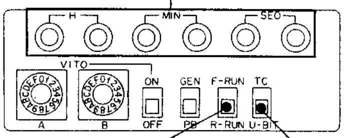


1 TC/U-BIT → TC

2 F-RUN/R-RUN → R-RUN
4 If necessary, set the F-RUN/R-RUN selector to F-RUN.

User bits

3 Set the user bits figure.



2 F-RUN/R-RUN → R-RUN

1 TC/U-BIT → U-BIT

It is possible to set the time data and user bits successively. In this case, if the time code is to be used in the F-RUN mode, set the user bits first, then the time data, and then set the F-RUN/R-RUN selector to F-RUN.

Maintaining the time code during battery replacement
The back-up battery holds the time code for about 1 minute while the battery is replaced.

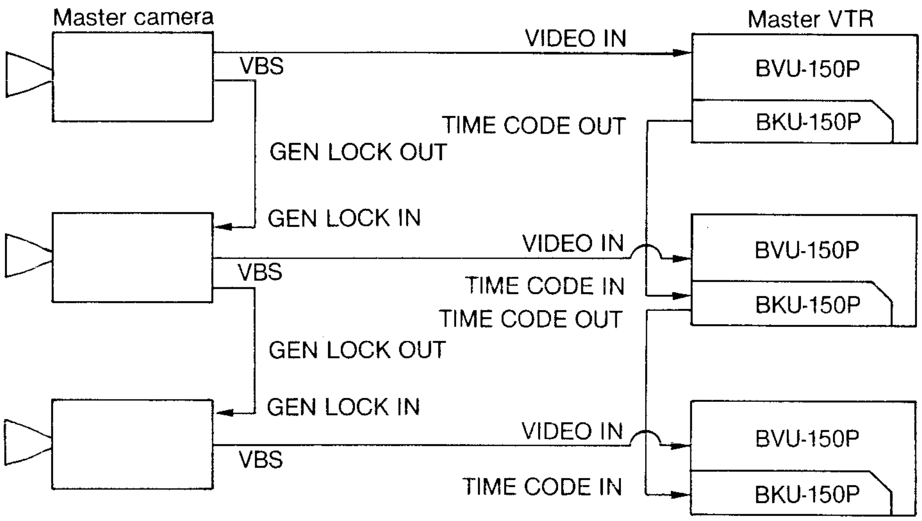
1-8-2. Time Code Slave-lock

The BKU-150P, connected to the BVU-150P, can be locked to an external time code generator if the external time code is synchronized with the input video signal.

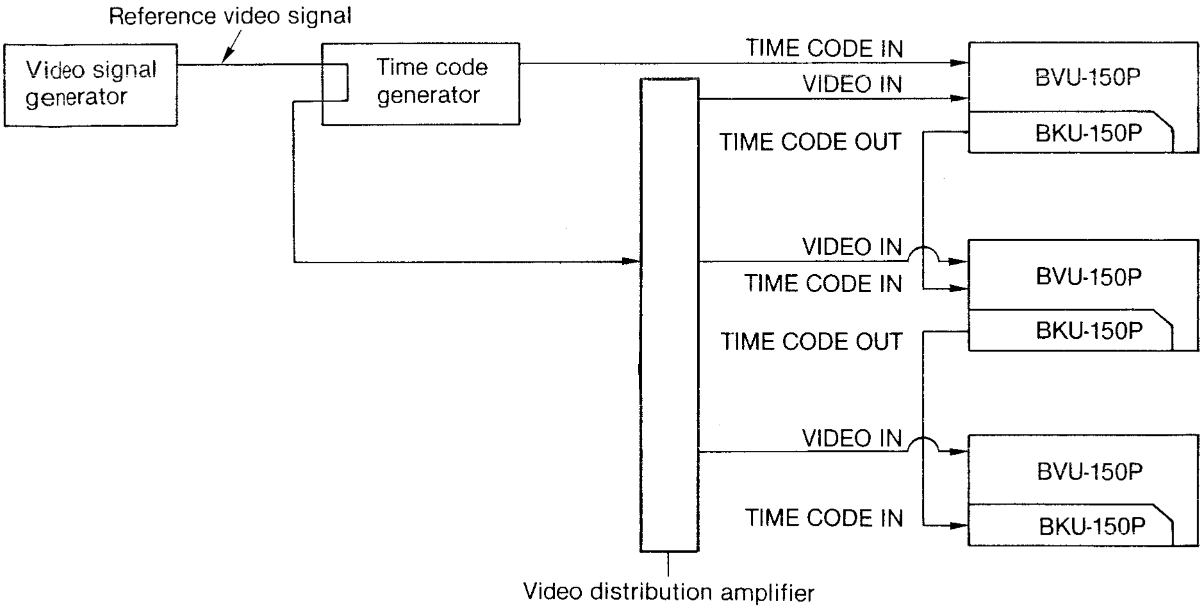
Notes

- To slave-lock the time code, set the switches as follows:
  CTL/TC selector on the BVU-150P: TC
  GEN/PB selector on the BKU-150P: GEN
  F-RUN/R-RUN selector on the BKU-150P: F-RUN
- The user bits can also be slave-locked to the master user bits by wiring the jumpers on the internal printed circuit board. For details, refer to Section 2.

Connection example 1: To lock the BKU-150P time code generators to one master BKU-150P

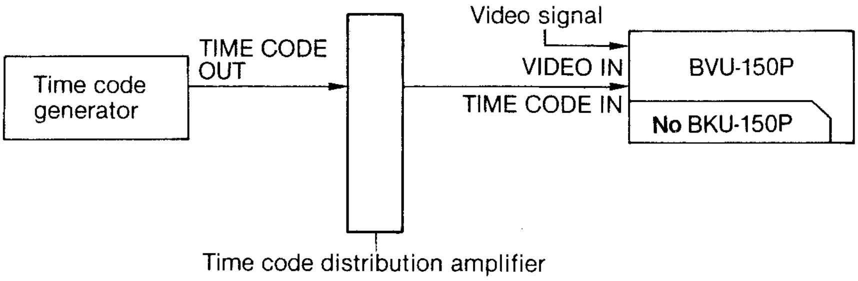


Connection example 2: To lock the BKU-150P time code generators to an external time code generator



1-8-3. Time Code Recording without BKU-150P Time Code Generator

Connection example



Notes

- The phase relation between the reference time code and the reference video signal should satisfy the EBU time code standards.
- After the time code is locked, wait for a few seconds until the sync generator of the camera has stabilized before setting the VTR in the record mode.
- After the time code is locked, the cable between the TIME CODE OUT and TIME CODE IN connectors of the VTRs can be detached. In this case, if a camera is not connected to the VTR, the time code advances with its clock.

1-9. WARNING SYSTEM

During recording, the warning lamps, earphone tone and camera (with the Q type connector) tally lamps serve to advise the operator of the following operational states.

Warning lamps		Earphone tone	State	Camera tally lamps		VTR operation
Lamp	Operation			REC/TALLY	BATT[*2]	
SERVO[*1]	◔ (While in the recording mode)	ʌʌʌ ʌʌʌ ʌʌʌ ʌʌʌ	Irregularity in servo	◔		Recording continues. Recording may not be performed correctly.
HUMID	○ (In all modes)	ʌʌʌ ʌʌʌ ʌʌʌ ʌʌʌ	Moisture condensation	◔		Recording continues, if the recorder is in the record mode, as long as the tape does not stick to the head drum. If this happens or the unit is in any of the other modes, the recorder will stop. Remove the cassette by pressing the EJECT button.
SLACK	◔ (In all modes)	ʌʌʌʌʌʌʌʌʌʌʌʌ	Tape slack	◔		Recording stops. Remove the cassette by pressing the EJECT button. If the cassette compartment will not raise, keep the recorder's power on and contact your authorized Sony dealer.
TAPE END	◒ (While in the recording mode)	ʌʌʌ	Near end	◒		Recording continues.
	○[*3] (In all modes)	ʌʌʌʌʌʌʌʌʌʌʌʌ [*3]	Tape end	◔[*3]		Recording stops. Change the cassette.
BATTERY	◒ (In all modes)	ʌʌʌ (While in the recording mode)	Near end	◒	◒	Recording continues.
	○ (In all modes)	ʌʌʌʌʌʌʌʌʌʌʌʌ	Discharge	◔	○	Recording stops. Change the batteries.

Meaning of the marks

Lamps	Sound of alarm
◔ Blinks in 4 Hz	ʌʌʌ 1 second interval
◒ Blinks in 1 Hz	ʌʌʌ ʌʌʌ ʌʌʌ ʌʌʌ 1/4 second interval
○ Lights up	ʌʌʌʌʌʌʌʌ Continuous sound

Notice on moisture condensation

Moisture may condense on the drum assembly if the recorder is moved directly from a cold to a warm location or if the recorder is used in a very humid place. This may result in damage to the tape when it adheres to the head drum. To avoid this, take the following precautions.

- When the recorder is moved directly from a cold location to a warm location, be sure to remove the cassette.
- Before inserting a cassette, set the POWER switch to ON and check that the HUMID lamp does not light. If it lights, do not insert a cassette. Turn off the power and wait until the HUMID lamp does not light when the power is turned on.
- If moisture has condensed in the VTR with a cassette inserted, proceed as follows:
  If the POWER switch is set to OFF, set the POWER switch to ON. Press the EJECT button to remove the cassette. Turn off the power and wait until the HUMID lamp does not light when the power is turned on.

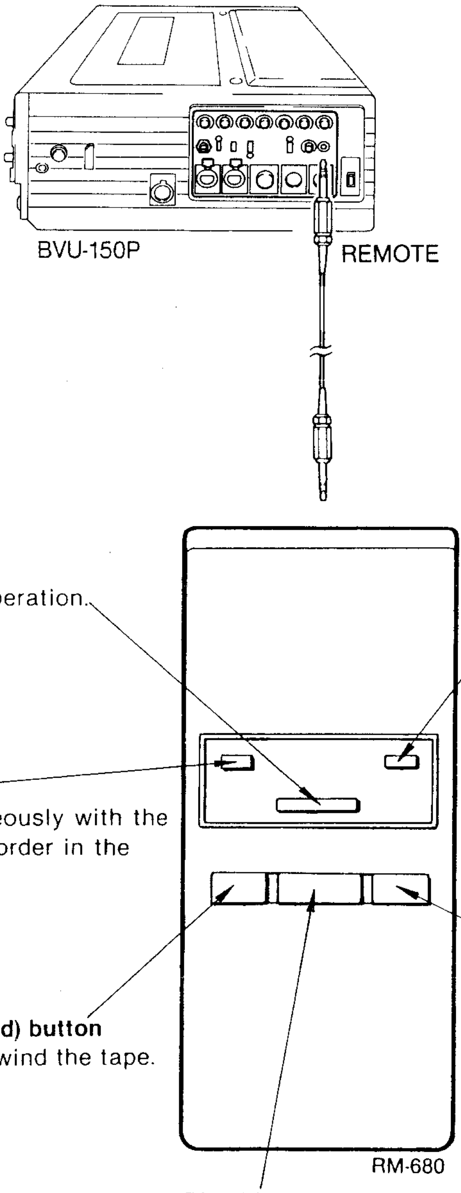
[*1] If the SERVO lamp blinks, check the connections.

[*2] The BATT lamp functions when the VTR's battery pack or the camera's battery pack are exhausted.

[*3] After the recording stops, the lamp and the earphone tone will go off.

1-10. REMOTE CONTROL

With the RM-680 remote control unit (optional), operation can be remotely controlled from as far as 5 meters.



STOP button
Press to stop the operation.

PAUSE button
Press to momentarily stop the tape in the record or playback mode.

REC (record) button
Press this button simultaneously with the PLAY button to set the recorder in the record mode.

F FWD (fast forward) button/lamp
Press to advance the tape rapidly.

REW (rewind) button
Press to rewind the tape.

PLAY button
Press to play back the tape. To initiate a recording, press this button while pressing the REC button.

1-11. VIDEO HEAD CLEANING

If the picture completely disappears at times or if only snow or streaks appear on the monitor screen, the video heads may be dirty. Clean the heads using the KCS-1C cleaning cassette (optional).
Insert a cleaning cassette and set the recorder in the record mode by pressing the REC and PLAY buttons simultaneously. Press the STOP button after about 30 seconds.

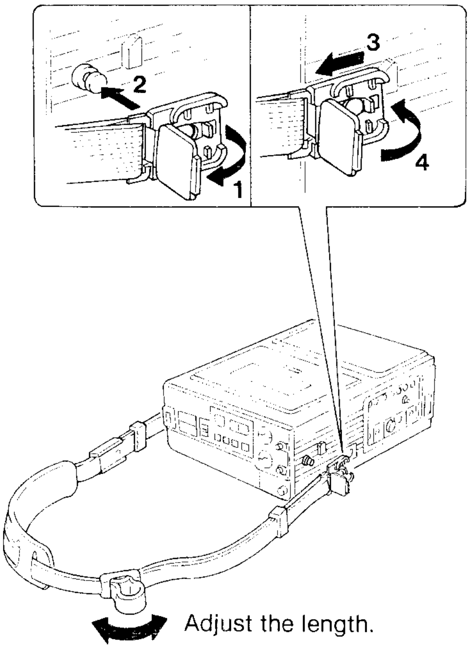
Notes

- Do not run a cleaning cassette for more than 30 seconds at a time, nor use it unless the picture symptoms clearly indicate the need for head cleaning. Excessive use of the cleaning cassette will shorten the life of the heads.
- Do not rewind the cleaning cassette every time it is used. Run the tape to its end, and then rewind it.
- A cleaning cassette can be used several times, although it does gradually become less effective each time.

1-12 SUPPLIED ACCESSORIES

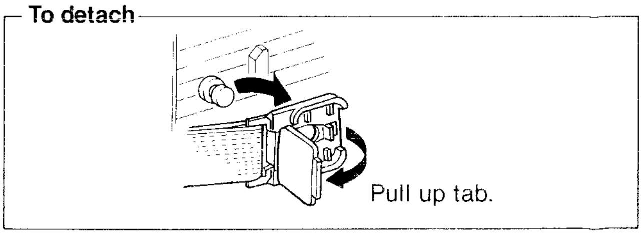
1-12-1. Shoulder Strap

The supplied shoulder strap can be attached to the VTR and the machine carried on the operator's shoulder. Attach both ends of the strap to the lugs at either side of the machine.



Adjust the length.

To detach

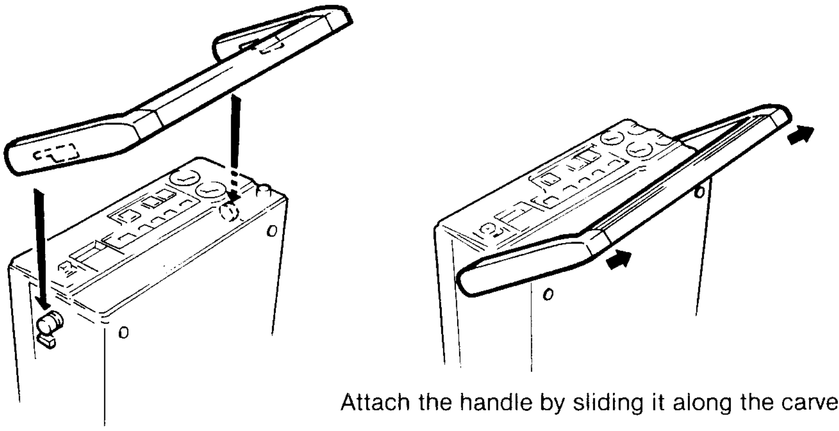


Pull up tab.

1-12-2. Carrying Handle

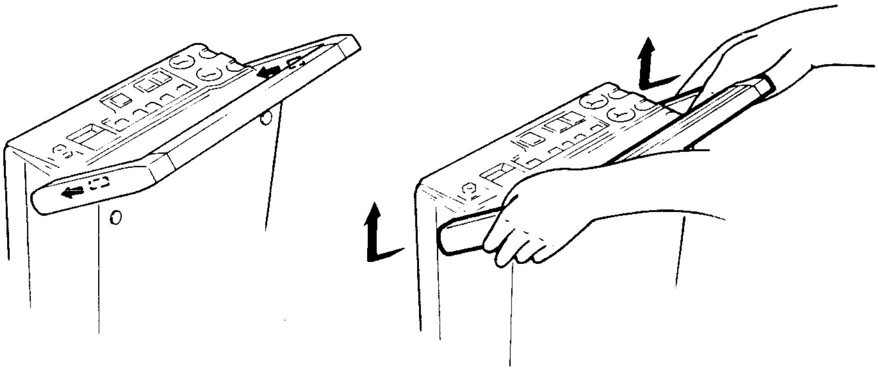
The supplied carrying handle can be attached to the VTR as shown below.

To attach

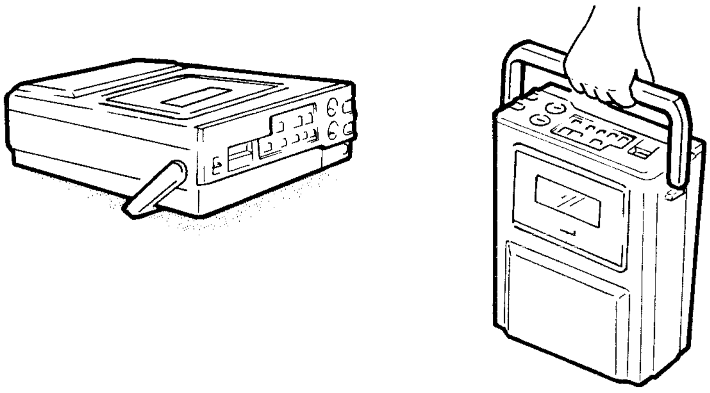


Attach the handle by sliding it along the carved line.

To remove

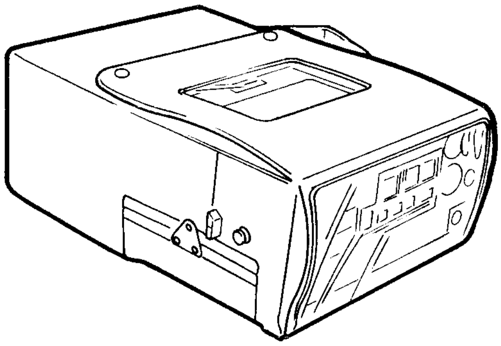


To use



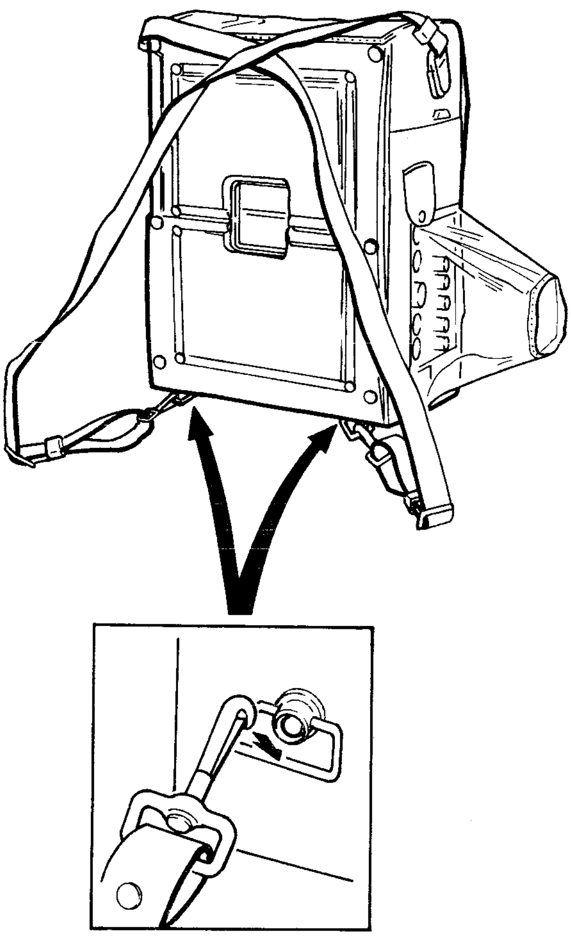
1-12-3. Soft Carrying Case

Use the supplied soft carrying case to protect the recorder from rain or dust.



1-12-4. Carrying Straps

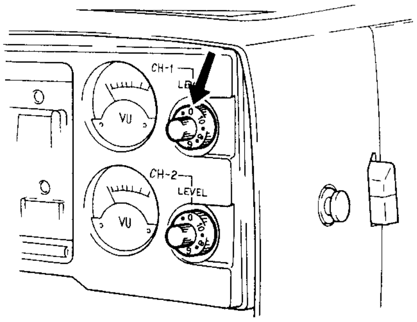
The supplied carrying straps can be attached for easy carrying of the VTR on your back when the supplied soft carrying case is used.



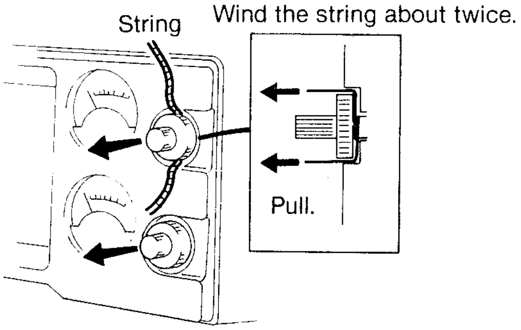
1-12-5. Changing the Level Control Knobs

The knobs of the CH-1 LEVEL and CH-2 LEVEL controls can be replaced with the supplied flat knobs.

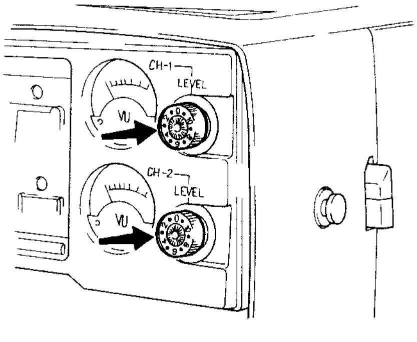
1 Turn the control to "0".



2 Wind a string as illustrated below and pull the string toward you to pull out the knob.



3 Push the supplied flat knob back.



1-13. SPECIFICATIONS

Mechanical

Power requirements	$12\ V^{+2}_{-1}\ V$ BP-90 battery pack (Ni-Cd, 3.5 Ah) AC power source operation possible using the AC-500CE ac power adaptor
Power consumption	Less than dc 20 W
Connectors	VIDEO IN: BNC type, ×1 CAMERA: Q type, 14-pin, ×1 VIDEO OUT 1 and 2: BNC type, ×1 each AUDIO IN CH-1/L/DUB and AUDIO IN CH-2/R: XLR type, female, ×1 each AUDIO OUT MONI (CH-1/L) and AUDIO OUT CH-2/R: XLR type, male, ×1 each SC IN: BNC type, ×1 TIME CODE IN: BNC type, ×1 TIME CODE OUT: BNC type, ×1 RF (OFF TAPE): BNC type, ×1 DC IN 12V: XLR type, ×1 REMOTE: Special mini jack, ×1 EARPHONE: Mini jack
Operating position	Both vertical and horizontal
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +60°C (−4°F to +140°F)
Operating humidity	Less than 85% (relative humidity)
Dimensions	Approx. 263 × 139 × 355 mm (w/h/d) ($10^3/_8$ × $5^1/_2$ × 14 inches) not incl. projecting parts and controls
Weight	Approx. 6.8 kg (15 lb)

Video

Video head	Rotary 4 heads (R/P: 2, Simultaneous playback: 2)
Video recording system	Luminance: FM Chrominance: SC low-range conversion
Video signal system	CCIR-standards, PAL color signal
Input	Composite, sync negative, 1.0 V(p-p)±0.3 V, 75 ohms, unbalanced
Output	Composite, sync negative, 1.0 V(p-p)±0.2 V, 75 ohms, unbalanced
Horizontal resolutions	SP mode: 300 lines (monochrome/color mode) Conventional mode: 260 lines (monochrome/color mode)
Signal-to-noise ratio	SP mode: More than 45 dB (color mode) Conventional mode: More than 45 dB (color mode)
K-factor (2T pulse)	SP mode: Less than 4%

Audio

Input	CAMERA (microphone input): Channel 2, −20 dB/−60 dB switchable, more than 3 k ohm impedance, balanced AUDIO IN CH-1/L/DUB and AUDIO IN CH-2/R: Line input: +4 dB, more than 10 kohm impedance, balanced Microphone input: −60 dB, more than 3 k ohm impedance, balanced
Output	AUDIO OUT MONI (CH-1/L) and AUDIO OUT CH-2/R: +4 dB (at 600 ohm load), balanced EARPHONE: −33 to −20 dB (at 8 ohm load), adjustable
Signal-to-noise ratio	Better than 50 dB (at 3% distortion)
Frequency response	SP mode: 50 Hz to 15 kHz ±3 dB Conventional mode: 50 Hz to 15 kHz ±4 dB

Tape transport

Tape speed	9.53 cm/sec. (3.75 ips)
Wow and flutter	±0.2% DIN
Recording time	20 min. continuously with KCS-20/KSP-S20, 10 min. continuously with KCS-10/KSP-S10
Rewind and fast forward time	Within 3 min. (KCS-20/KSP-S20)
Operating time	Approx. 1 hour continuously connected to a BVP-330AP camera, with a fully charged BP-90 battery
Interchangeability	Fully interchangeable with all conventional U-matic H recorders/players
Usable tape	KCS and KSP-S type tape

Special functions

Simultaneous playback picture and tape remaining time indication	Possible with a camera having the return video function
Pause	Possible
Search	Possible (about 10 times normal speed in forward and reverse directions)
Edit	Audio dubbing
Tracking control	Possible
Remote control	Record, playback, fast forward, rewind, pause and stop, with an optional RM-680 remote control unit

Time code

Input	0.5 to 5 V(p-p), 10 k ohms, unbalanced
Output	0 dB ±3 dB, low impedance, unbalanced (0 dB = 1.55 V p-p pulse)
SC Input	2 V (p-p)±1 V, 75 ohms, unbalanced
RF output (off tape)	0.5 V (p-p)±0.1 V, 75 ohms, unbalanced

Accessories supplied

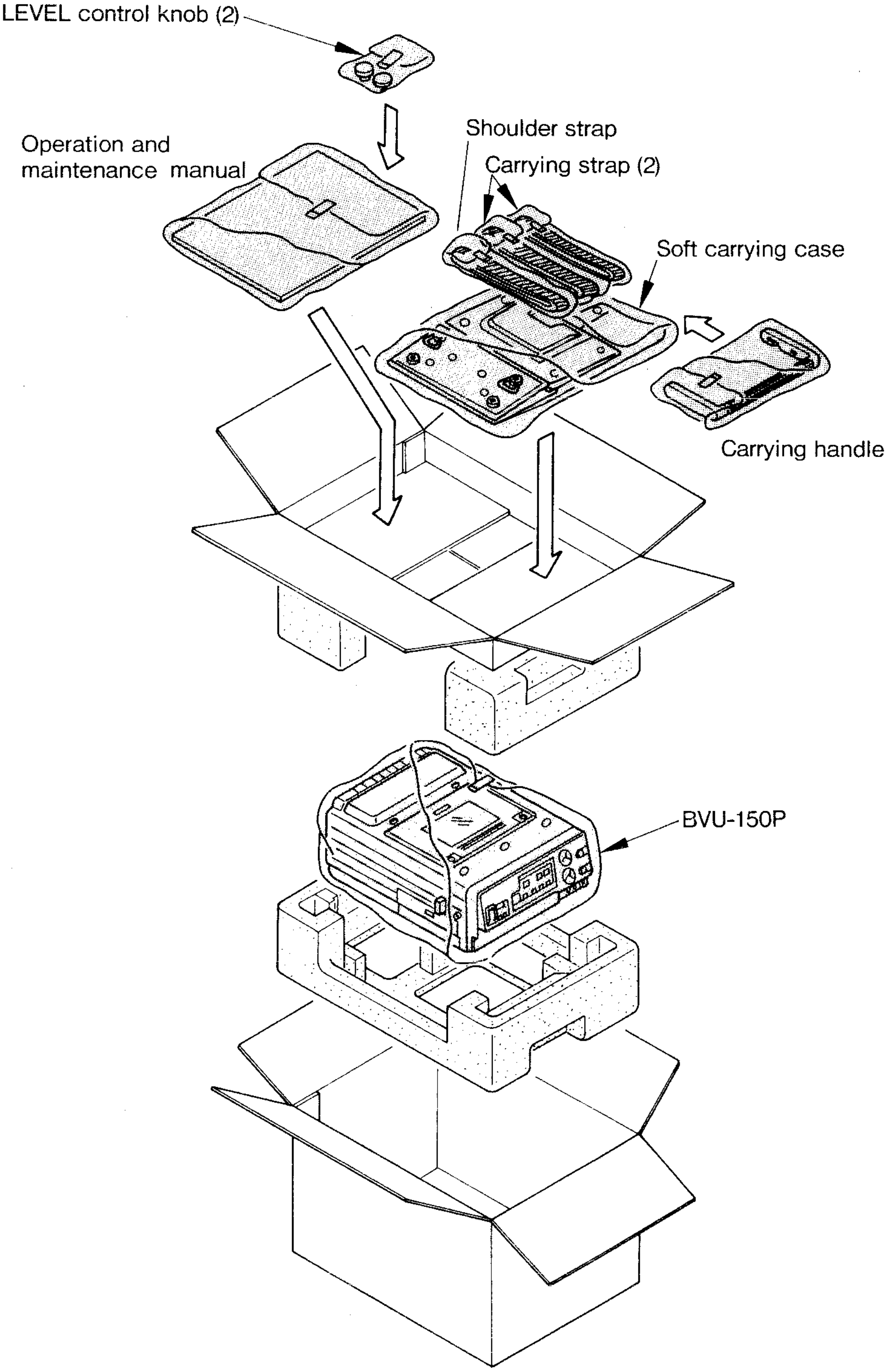
Shoulder strap (1)
Carrying strap (2)
Carrying handle (1)
Soft carrying case (1)
LEVEL control knob (2)
Operation and maintenance manual (1)

Optional accessories

AC-500CE ac power adaptor
BC-210CE battery charger
RM-680 remote control unit
BP-90 rechargeable battery
KCS and KSP-S series video cassette
KCS-1C cleaning cassette

Design and specifications subject to change without notice.

1-14. PACKING


LEVEL control knob (2)
Operation and maintenance manual
Shoulder strap
Carrying strap (2)
Soft carrying case
Carrying handle
BVU-150P

TEIL 1
BETRIEB

1-1. BESONDERE MERKMALE

1-1-1. Neues Format

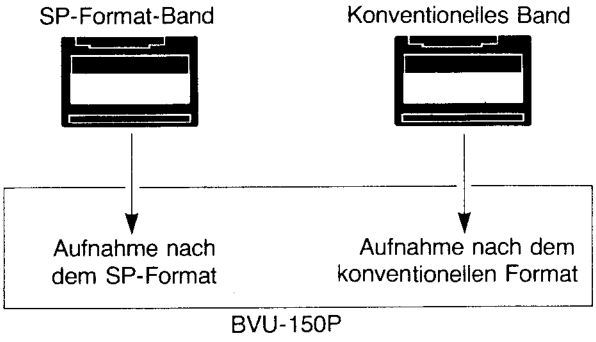
Überragende Bildqualität durch neu entwickeltes SP-Format (Super Performance)

Bei diesem neuen SP-Format wird der Y-Träger um 0,8 MHz angehoben, so daß sich eine größere Bandbreite und damit verbesserte Bildqualität ergibt. Ein speziell auf das SP-Format zugeschnittenes hochwertiges Band — das sog. SP-Format-Band — steht bereits zur Verfügung. Wird eine SP-Format-Cassette eingesetzt, erfolgt die Aufnahme automatisch mit dem neuen SP-Format.

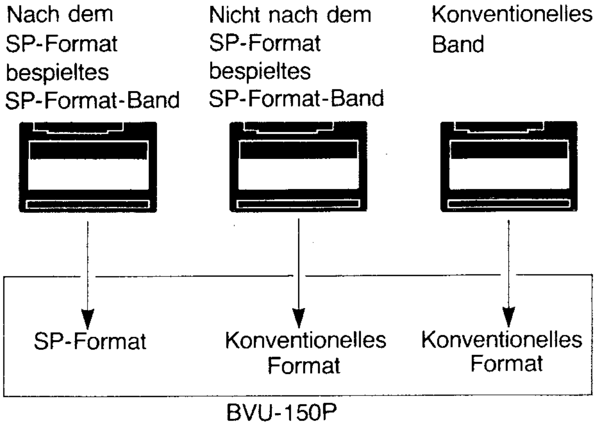
Kompatibilität zwischen SP-Format und herkömmlichem Aufnahmeformat

Im BVU-150P können sowohl SP-Format-Bänder als auch herkömmliche U-matic-Bänder verwendet werden. Ein spezieller Schaltkreis erkennt beim Aufnehmen das Format der eingelegten Cassette und beim Wiedergeben das Format der Bandaufzeichnung. Bei herkömmlichen KCS-Bändern wird automatisch auf das konventionelle Format und bei den neuen KSP-S-Bändern auf das SP-Format geschaltet.

Aufnahme


SP-Format-Band
Konventionelles Band
Aufnahme nach dem SP-Format
Aufnahme nach dem konventionellen Format
BVU-150P

Wiedergabe


Nach dem SP-Format bespieltes SP-Format-Band
Nicht nach dem SP-Format bespieltes SP-Format-Band
Konventionelles Band
SP-Format
Konventionelles Format
Konventionelles Format
BVU-150P

1-1-2. Einrichtungen für zuverlässige Kameraaufnahmen

Videokontroll-Einrichtung

Wenn eine mit Rücklaufvideotaste ausgestattete Kamera am CAMERA-Anschluß angeschlossen wird, kann ein simultanes Wiedergabebild (unmittelbar zuvor aufgezeichnetes Bild) im Sucher der Kamera überwacht werden. Somit hat man stets Sicherheit, daß die Aufnahme einwandfrei ausgeführt wird.

Schutz gegen versehentliche Aufnahmeunterbrechung

Steht die KEY INHIBIT-Taste auf ON, so arbeitet keine Taste mehr außer der EJECT-Taste, so daß ein versehentliches Unterbrechen verhindert wird.

Außerdem arbeitet beim Aufnehmen keine Taste außer der STOP- und EJECT-Taste.

Warnsystem

Blinkende oder leuchtende Indikatoren signalisieren dem Bedienungspersonal sofort, daß beispielsweise der Bandende-Abschaltmechanismus angesprochen oder die Batterie erschöpft ist. Über Ohrhörer ist gleichzeitig ein Warnton zu hören. Ist die Kamera mit einem Sony Q-Typ-Anschluß (14pol) ausgestattet, so blinken die Warn-Indikatoren im Sucher entsprechend den betreffenden Indikatoren des Recorders.

Bandrestzeit-Anzeige

Bei Verwendung einer mit Rücklaufvideotaste ausgestatteten Kamera kann die restliche Bandzeit im Kamera-Sucher erkannt werden.

1-1-3. Schnitt-Funktionen

Schnelles Servosystem

Dank dem schnellen Wiedergabe-Servosystem können die Aufnahmeszenen problemlos aneinandergefügt werden, ohne daß es an den Schnittstellen zu Störungen kommt.

Nachvertonung

Eine bereits vorhandene Videoaufzeichnung kann nachträglich mit Kommentar, Musik usw. unterlegt werden.

1-1-4. Audio-Funktionen

Hochqualitative Tonaufzeichnung
Der Sendust-Tonkopf liefert eine hochqualitative Tonaufzeichnung bis zu den höchsten Frequenzen.

Dolby-Rauschverminderung mit automatischer Umschaltung
Zur Verminderung des Bandrauschens ist der BVU-150P mit dem Dolby-NR*-System ausgestattet. Das Dolby-System kann beliebig beim Aufnehmen und Wiedergeben ein- oder ausgeschaltet werden.

* „Dolby" und das Doppel-D-Symbol sind eingetragene Warenzeichen der Dolby Laboratories Licensing Corporation. Das Rauschverminderungssystem wird unter Lizenz der Dolby Laboratories Licensing Corporation hergestellt.

Automatische oder manuelle Audiopegel-Aussteuerung
Der Audiopegel kann wahlweise manuell oder automatisch ausgesteuert werden. Bei manueller Aussteuerung wird ein Begrenzer zugeschaltet.

1-1-5. Weitere Besonderheiten

Kompakt und vielseitig
Der Recorder kann sowohl in vertikaler als auch in horizontaler Position betrieben werden. Er ist vollkommen frei von gyroskopischen Verzerrungen. Da er sich außerdem durch geringes Gewicht und kompakte Abmessungen auszeichnet, eignet er sich vorzüglich für portablen Einsatz.

Zeitcode-Aufnahme/Wiedergabe-Möglichkeit
Der EBU-Zeitcode kann auf der Adreßspur aufgezeichnet und wiedergegeben werden. Zum Aufnehmen ist der als Sonderzubehör erhältliche Zeitcode-Generator BKU-150P erforderlich.

Bildsuchlauf
Beim Rück- und Vorspulen bleibt das Bild sichtbar, so daß eine bestimmte Bandstelle leicht aufgefunden werden kann.

Externe Synchronisiermöglichkeit
Wenn beim Wiedergeben ein Videosignal an den VIDEO IN-Anschluß angeschlossen wird, kann der Recorder extern synchronisiert werden.

Logisch gesteuerte Bedienungselemente
Die Logiksteuerung ermöglicht ein direktes Umschalten in eine andere Betriebsart, ohne zuvor die STOP-Taste zu drücken.

Anschlußmöglichkeit für Time-Base-Corrector (TBC)
Der Recorder ist mit SC IN- und RF (OFF TAPE)-Anschlüssen ausgestattet, so daß ein Time-Base-Corrector angeschlossen werden kann.

1-2. ZUR BESONDEREN BEACHTUNG

Zur Sicherheit
Betreiben Sie das Gerät nur an 12 V Gleichspannung.

Zur Aufstellung
Halten Sie das Gerät von starken Magnetfeldern, hohen Temperaturen, übermäßigem Staub und Feuchtigkeit fern.

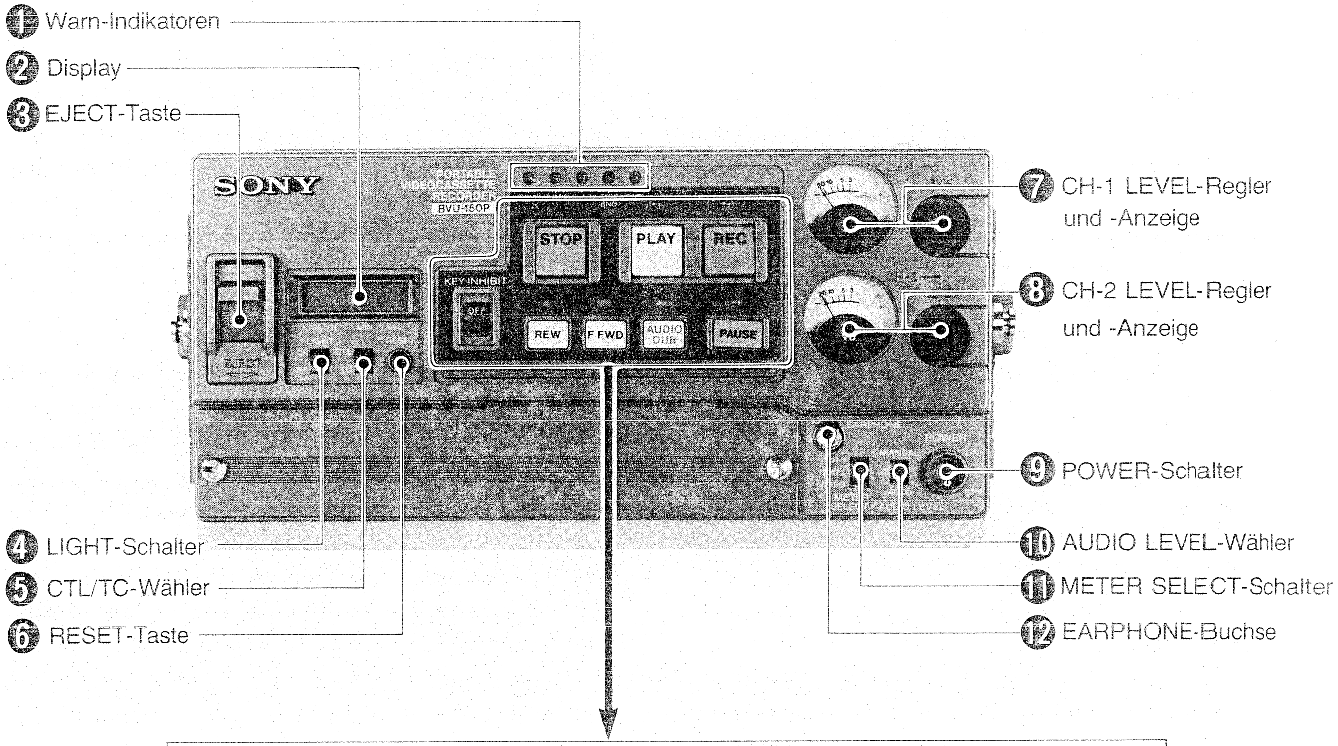
Zum Betrieb
- Setzen Sie das Gerät keinen starken Stößen aus.
- Betreiben Sie das Gerät nicht unmittelbar, nachdem es von einem kalten an einen warmen Ort gebracht wurde.

Zum Transport
Bewahren Sie den Karton und das Verpackungsmaterial für einen eventuellen späteren Transport des Geräts auf.

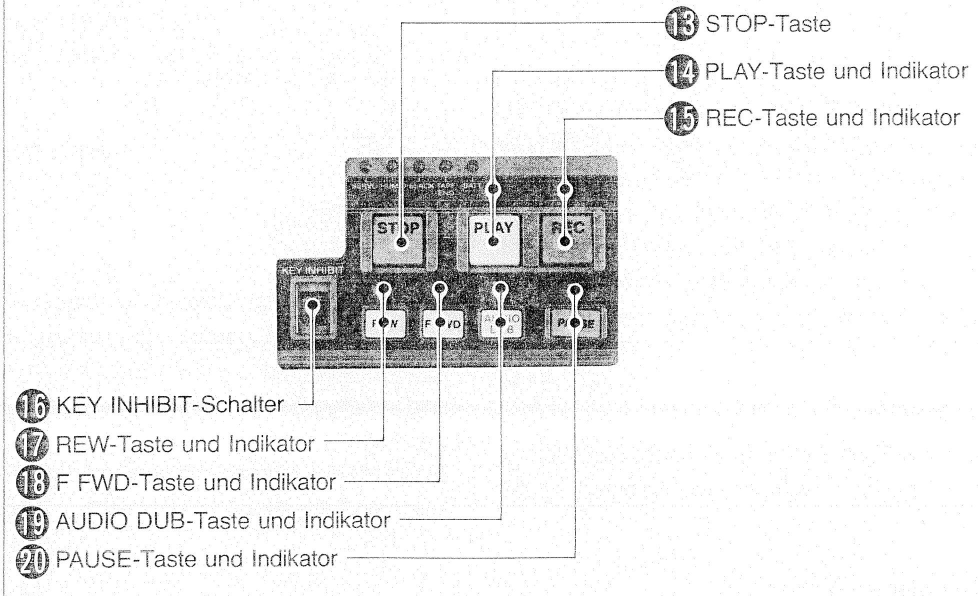
Ihre Sony Vertretung beantwortet Ihnen gerne weitere Fragen.

1-3. LAGE UND FUNKTION DER BEDIENUNGSELEMENTE

1-3-1. Bedienungspult



Funktionstasten


⑬ STOP-Taste
⑭ PLAY-Taste und Indikator
⑮ REC-Taste und Indikator
⑯ KEY INHIBIT-Schalter
⑰ REW-Taste und Indikator
⑱ F FWD-Taste und Indikator
⑲ AUDIO DUB-Taste und Indikator
⑳ PAUSE-Taste und Indikator
KEY INHIBIT

❶ Warn-Indikatoren

Diese Indikatoren blinken oder leuchten bei abnormalem Betriebszustand.

SERVO-Indikator

Blinkt, wenn das Kopftrommel- und Capstan-Servosystem nicht synchron verkoppelt sind.

HUMID-Indikator

Leuchtet, wenn sich Kondenswasser auf der Kopftrommel angesammelt hat oder die Luftfeuchtigkeit sehr hoch ist.

SLACK-Indikator

Blinkt, wenn das Band auf der Aufwickelseite (zwischen Capstan und Aufwickelspule) locker ist oder wenn die Kopftrommel gestoppt wird. In diesen Fällen stoppt der Bandtransport automatisch, um ein Verwickeln des Bandes zu verhindern.

TAPE END-Indikator

Blinkt ca. 1,5 Minuten vor dem Bandende. Wenn das Bandende dann erreicht ist, stoppt das Band automatisch und der Indikator leuchtet konstant auf.

BATT-Indikator

Blinkt, wenn die Spannung des eingesetzten Akkus BP-90 unter 11,3 V fällt und zeigt damit an, daß der Akku in Kürze erschöpft ist. Wenn die Spannung dann auf 11 V abgefallen ist, leuchtet der Indikator konstant auf und der Bandtransport stoppt automatisch.

❷ Display

Steht der CTL/TC-Wähler ❺ auf CTL, so werden die CTL-Signale gelesen und im Display als Minuten und Sekunden angezeigt. Wenn das Band hinter „00:00" zurückgespult wird, erhält man vor der Anzeige ein Minuszeichen (−).

Steht der CTL/TC-Wähler auf TC und ist der als Sonderzubehör lieferbare Zeitcode-Generator BKU-150P angeschlossen, so wird der Zeitcode in Stunden, Minuten und Sekunden angezeigt.

❸ Auswurftaste (EJECT)

Durch Drücken dieser Taste hebt sich das Cassettenfach, so daß die Cassette eingesetzt oder herausgenommen werden kann.

❹ Beleuchtungsschalter (LIGHT)

In der Stellung ON werden das Display und die VU-Meter beleuchtet. Um die Beleuchtung wieder auszuschalten, stellen Sie den Schalter auf OFF.

❺ CTL/TC-Wähler

Zur Wahl der im Display ❷ angezeigten Daten: CTL (Kontrollsignal) oder TC (Zeitcode). Wenn der als Sonderzubehör lieferbare Zeitcode-Generator BKU-150P nicht angeschlossen ist, so wird das CTL-Signal ausgelesen und angezeigt, selbst wenn der Wähler auf TC gestellt ist.

❻ Rückstelltaste (RESET)

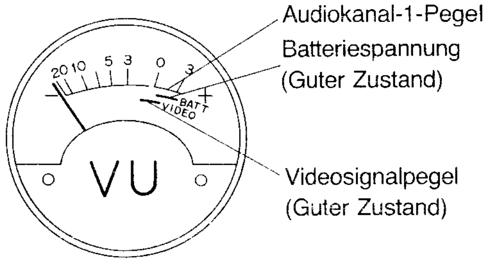
Durch Drücken dieser Taste wird die CTL-Zeitzählung im Display ❷ auf 00:00 zurückgestellt. Außerdem wird auch der Zeitcode auf 00:00:00 zurückgesetzt, vorausgesetzt der F-RUN/R-RUN-Wähler am angeschlossenen Zeitcode-Generator BKU-150P (Sonderzubehör) steht auf R-RUN (Aufnahmelauf). Die Taste arbeitet nicht, wenn der F-RUN/R-RUN-Wähler auf F-RUN (Freilauf) steht.

❼ Pegelregler und Anzeige für Audiokanal 1 (CH-1 LEVEL)

Zum manuellen Einstellen des Aufnahmepegels von Audiokanal 1 stellen Sie den AUDIO LEVEL-Wähler ❿ auf MANUAL und den METER SELECT-Schalter ⓫ auf CH-1 und justieren Sie dann den Regler unter Beobachtung der Anzeige ein.

Während der Wiedergabe kann an der CH-1 LEVEL-Anzeige der Ausgangspegel von Audiokanal 1 abgelesen werden.

Wenn der METER SELECT-Schalter auf BATT oder VIDEO gestellt wird, kann auf der CH-1 LEVEL-Anzeige auch der Batteriezustand bzw. der Videopegel kontrolliert werden.



❽ Pegelregler und Anzeige für Audiokanal 2 (CH-2 LEVEL)

Zum manuellen Einstellen des Aufnahmepegels von Audiokanal 2 stellen Sie den AUDIO LEVEL-Wähler ❿ auf MANUAL und justieren Sie dann den Regler unter Beobachtung der Anzeige ein.

Während der Wiedergabe kann an der CH-2 LEVEL-Anzeige der Ausgangspegel von Audiokanal 2 abgelesen werden.

⑨ Ein/Aus-Schalter (POWER)

Zum Einschalten des Recorders stellen Sie den Schalter auf ON. Auf der Zeitanzeige erscheint dann eine Ziffer, und die Kamera wird mit Strom versorgt, wenn sie mit dem CAMERA-Anschluß verbunden ist.

⑩ Audiopegeleinstellwähler (AUDIO LEVEL)

AUTO: Der Aufnahmepegel wird automatisch optimal eingestellt.

MANUAL: Der Aufnahmepegel kann manuell eingestellt werden. In dieser Stellung wird grundsätzlich ein Begrenzer hinzugeschaltet, um bei Signalspitzen Übersteuerungsverzerrungen zu vermeiden.

⑪ Anzeigenwahlschalter (METER SELECT)

Die CH-1 LEVEL-Anzeige ⑦ kann hier wie folgt umgeschaltet werden:

CH-1: Audiokanal-1-Aufnahme/Wiedergabepegel
BATT: Batteriespannung
VIDEO: Video-Aufnahmepegel

⑫ Ohrhörerbuchse (EARPHONE) (Minibuchse)

Bei Anschluß eines 8-Ohm-Ohrhörers an diese Buchse kann das Aufnahme- oder Wiedergabesignal überwacht werden. Die Kanalwahl erfolgt am MONITOR-Wähler am Anschlußfeld: CH-1 (Kanal 1), CH-2 (Kanal 2) oder MIX (Mischsignal). Wenn eine der Warn-Indikatoren blinkt, ist im Ohrhörer zusätzlich ein akustisches Warnsignal zu hören.

⑬ STOP-Taste

Zum Stoppen des Betriebs.

⑭ Wiedergabetaste (PLAY) und Indikator

Zum Wiedergeben des Bandes drücken Sie diese Taste. Zum Aufnehmen halten Sie die REC-Taste gedrückt und drücken Sie gleichzeitig diese Taste.

⑮ Aufnahmetaste (REC) und Indikator

Zum Aufnehmen halten Sie diese Taste gedrückt und drücken Sie gleichzeitig die PLAY-Taste. Der Indikator blinkt während der Aufnahme.

Wird aus der Stopp-Funktion heraus nur die REC-Taste gedrückt, so erhält man am Videomonitor oder Kamera-Sucher ein E-zu-E-Bild*. Stellen Sie dann den Audiopegel ein und warten Sie einige Zeit im E-zu-E-Betrieb, bis die Kamera aufgewärmt ist.

Auch beim Vorspulen, Rückspulen sowie beim Wiedergeben erhält man durch Drücken dieser Taste ein E-zu-E-Bild.

* E-zu-E-Bild (Elektronik zu Elektronik)

Hierbei handelt es sich um das Videoeingangssignal, das die Elektronikschaltkreise des Recorders bereits durchlaufen hat und auf dem Videomonitor oder im Kamera-Sucher zu sehen ist.

⑯ Sperrschalter (KEY INHIBIT)

In der Stellung ON werden alle Tasten (außer EJECT-Taste) gesperrt, um ein versehentliches Unterbrechen der Aufnahme zu verhindern.

⑰ Rückspultaste (REW) und Indikator

Drücken Sie diese Taste zum Rückspulen des Bandes. Der Indikator leuchtet auf. Während des Rückspulens erhält man ein Wiedergabebild mit hoher Geschwindigkeit in Rückwärtsrichtung, das durch Störstreifen gestört ist (Bildsuchlauf). Wenn das Band vollkommen zurückgespult ist, schaltet das Gerät automatisch in die Stopp-Funktion.

⑱ Vorspultaste (F FWD) und Indikator

Drücken Sie diese Taste zum Vorspulen des Bandes. Der Indikator leuchtet auf. Während des Vorspulens erhält man ein Wiedergabebild mit hoher Geschwindigkeit in Vorwärtsrichtung, das durch Störstreifen gestört ist (Bildsuchlauf). Wenn das Band vollkommen vorgespult ist, schaltet das Gerät automatisch in die Stopp-Funktion.

⑲ Audioüberspieltaste (AUTO DUB) und Indikator

Durch Drücken dieser Taste wird der Audiokanal 1 auf E-zu-E-Betrieb geschaltet, so daß der Audiopegel vor dem eigentlichen Überspielstart eingestellt werden kann.

Zum Starten des Überspielvorgangs drücken Sie diese Taste zusammen mit der PLAY-Taste. Es ist möglich, nur auf Kanal 1 ein Audiosignal aufzuzeichnen, ohne die bereits aufgezeichneten Video- und Audiokanal-2-Signale zu beeinflussen.

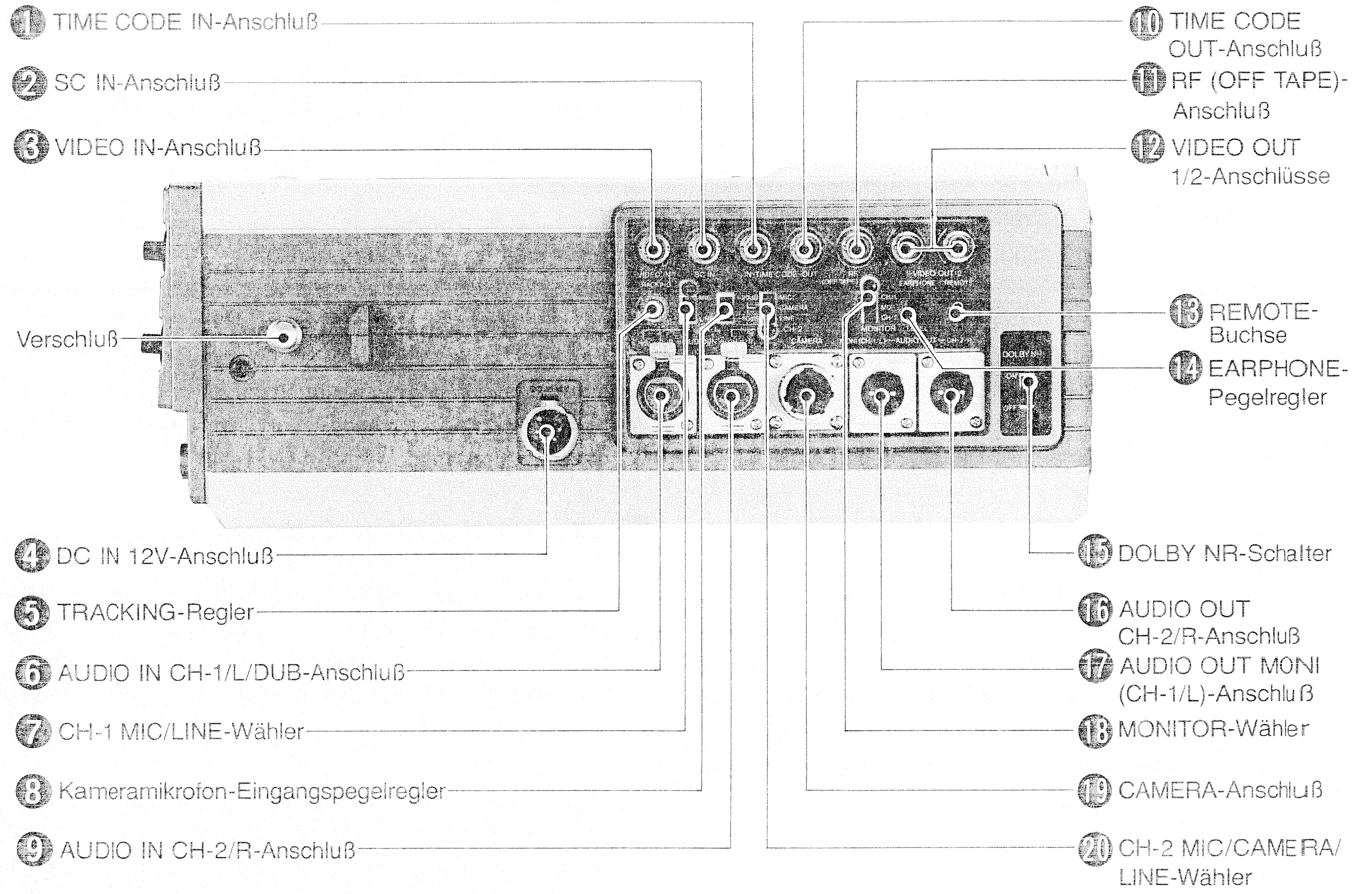
⑳ Pausentaste (PAUSE) und Indikator

Durch Drücken dieser Taste kann beim Aufnehmen oder Wiedergeben das Band kurzzeitig gestoppt werden. Der Indikator blinkt während dieses Pausenbetriebs. Zum Abschalten des Pausenbetriebs drücken Sie die Taste erneut. Während der Wiedergabe-Pause erhält man ein Standbild.

- Bleibt der Recorder mehr als acht Minuten auf Pause geschaltet, so spricht der Bandschutzmechanismus an und die Bandspannung wird gelockert. Das E-zu-E-Bild und das Standbild ist dann nicht mehr auf dem Monitorschirm zu sehen.

  Durch erneutes Drücken der PAUSE-Taste kann wieder in die Pausenfunktion zurückgeschaltet werden. Beim Ansprechen des Bandschutzmechanismus kommt es zu Bildstörungen.

1-3-2. Anschlußfeld



① Zeitcode-Eingang (TIME CODE IN) (BNC-Buchse)
Schließen Sie hier das Zeitcode-Ausgangssignal eines Zeitcode-Generators oder eines anderen Videorecorders an, um ein Zeitcodesignal aufzuzeichnen.

② Hilfsträger-Eingang (SC IN) (BNC-Buchse)
Ein externer Hilfsträger (4,43 MHz) für das Wiedergabe-Chrominanzsignal kann hier zugeleitet werden. Verbinden Sie diesen Eingang mit einem Time-Base-Corrector.

③ Video-Eingang (VIDEO IN) (BNC-Buchse)
Hier kann ein FBAS-Signal zugeleitet werden. Beim Aufnehmen dieses Signals sollte der CAMERA-Anschluß ⑲ freibleiben.

④ 12-V-Gleichspannungseingang (DC IN 12 V) (XLR, 4pol)
Zur externen Stromversorgung mit 12 V Gleichspannung. Beispielsweise kann der Sony Netzadapter AC-500CE angeschlossen werden.

⑤ Spurlagenregler (TRACKING)
Mit diesem Regler können Spurlagenabweichungen ausgeglichen werden, wenn ein auf einem anderen Gerät bespieltes Band wiedergegeben wird. Stellen Sie den Regler normalerweise in die einrastende Mittelstellung. Beim Aufnehmen hat der Regler keinen Einfluß.

⑥ Eingang für Audiospur 1
(AUDIO IN CH-1/L/DUB) (XLR, 3pol)
Um ein Audiosignal auf Audiospur 1 zu überspielen, kann hier ein Mikrofon oder der Line-Ausgang einer anderen Audiosignalquelle angeschlossen werden. Die Einstellung des Audiopegels erfolgt am CH-1 MIC/LINE-Wähler ⑦

⑦ Mikrofon/Line-Wähler für Kanal 1 (CH-1 MIC/LINE)
Je nach der am AUDIO IN CH-1/L/DUB-Auschluß ⑥ angeschlossenen Signalquelle ist dieser Wähler wie folgt einzustellen.

MIC: Für Mikrofon.

LINE: Für andere Audiosignalquellen.

❽ Kameramikrofon-Eingangspegelwähler

Je nach Mikrofonpegel, den die am CAMERA-Anschluß ⓳ angeschlossene Kamera liefert, stellen Sie den Wähler auf −20 dB oder −60 dB.

Wird das Mikrofon am AUDIO IN CH-1/L/DUB-Anschluß ❻ oder AUDIO IN CH-2/R-Anschluß ❾ angeschlossen, so ist keine Einstellung erforderlich.

Einstellungsbeispiele

Verwendete Kamera	Schalterstellung
BVP-300AP	−60 dB
BVP-330P	−60 dB
BVP-150P	Einstellung entsprechend Kameramikrofon-Pegeleinstellung
DXC-1800-Serie	−60 dB
DXC-1820-Serie	−60 dB
DXC-M3-Serie	−60 dB
DXC-M3A-Serie	Einstellung entsprechend Kameramikrofon-Pegeleinstellung

❾ Eingang für Audiospur 2
(AUDIO IN CH-2/R) (XLR, 3pol)

Um ein Audiosignal auf Audiospur 2 aufzunehmen, kann hier ein Mikrofon oder der Line-Ausgang einer anderen Audiosignalquelle angeschlossen werden. Die Einstellung des Audiopegels erfolgt am CH-2 MIC/CAMERA/LINE-Wähler ⓴.

❿ Zeitcode-Ausgang (TIME CODE OUT) (BNC-Buchse)

Das vom angeschlossenen Zeitcode-Generator BKU-150P (Sonderzubehör) gelieferte bzw. das von Band wiedergegebene Zeitcodesignal liegt hier an. Vebinden Sie diesen Ausgang mit dem Zeitcode-Eingang eines Zeitcode-Lesers oder eines anderen Videorecorders.

⓫ HF-Anschluß (RF (OFF TAPE)) (BNC-Buchse)

Diese Buchse liefert das nicht demodulierte FM-Signal. Zur Drop-Out-Kompensation kann hier ein externer Drop-Out-Kompensator (DOC) angeschlossen werden.

⓬ Video-Ausgänge 1/2 (VIDEO OUT) (BNC-Buchse)

Das FBAS-Signal kann hier abgegriffen werden. Schließen Sie hier den Video-Eingang eines Videomonitors, Videorecorders oder Time-Base-Correctors an.

⓭ Fernbedienungsbuchse (REMOTE) (Spezial-Minibuchse)

Zum Anschluß der Fernsteuereinheit RM-680 (Sonderzubehör).

⓮ Ohrhörerpegelregler (EARPHONE)

Zur Einstellung der Ohrhörerlautstärke.

⓯ DOLBY NR-Schalter

Zum Ein- und Ausschalten des Dolby-Systems* für Aufnahme und Wiedergabe.

ON: Zum Aufnehmen und Wiedergeben mit Dolby-NR-Rauschverminderung. Normalerweise werden die Kanäle 1 und 2 gleichzeitig vom Dolby-System aufbereitet. Um das Dolby-System nur für Kanal 1 oder 2 zu verwenden, siehe Teil 2.

OFF: Zum Aufnehmen und Wiedergeben ohne Dolby.

* Das Dolby-System hebt niederpeglige Signale mit hoher Frequenz, die vom Bandrauschen überdeckt würden, an, so daß diese entscheidend über dem Bandrauschen liegen. Beim Wiedergeben wird der Pegel wieder auf den Ursprungspegel abgesenkt, wobei sich gleichzeitig auch das Bandrauschen um den gleichen Betrag vermindert.

⓰ Audio-Ausgang von Kanal 2 (AUDIO OUT CH-2/R) (XLR, 3pol)

Hier kann das Audiosignal von Kanal 2 abgegriffen werden.

⓱ Audio-Monitorausgang für Kanal 1
(AUDIO OUT MONI (CH-1/L)) (XLR, 3pol)

An diesem Anschluß liegt das am MONITOR-Wähler ⓲ gewählte Audiosignal an.

⓲ MONITOR-Wähler

Zur Wahl des am AUDIO OUT MONI (CH-1/L)-Anschluß ⓱ bzw. an der EARPHONE-Buchse (Bedienungspult) anliegenden Audio-Ausgangssignals.

CH-1: Audio-Ausgangssignal von Kanal 1.
MIX: Mischsignal aus Kanal 1 und 2.
CH-2: Audio-Ausgangssignal von Kanal 2.

⓳ Kamera-Anschluß (CAMERA) (Q-Typ, 14pol)

Zum Anschluß des Ausgangssignals einer Sony Farb-Videokamera. Beim Aufnehmen dieses Signals sollte der VIDEO IN-Anschluß ❸ offen bleiben.

⓴ Mikrofon/Kamera/Line-Wähler für Kanal 2
(CH-2 MIC/CAMERA/LINE)

Entsprechend der am AUDIO IN CH-2/R-Anschluß ❾ angeschlossenen Audiosignalquelle ist dieser Wähler wie folgt einzustellen.

MIC: Für Mikrofon.
CAMERA: Für das dem CAMERA-Anschluß ⓳ zugeleitete Audiosignal.
LINE: Für andere Audio-Eingangssignale.

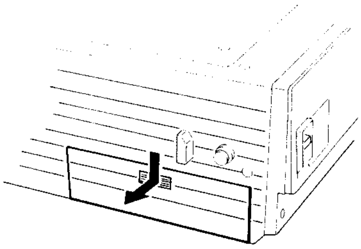
1-4. STROMQUELLEN

Der Viedeorecorder BVU-150P kann entweder über den aufladbaren Akku BP-90 (Sonderzubehör) oder über den Netzadapter AC-500CE (Sonderzubehör) betrieben werden.

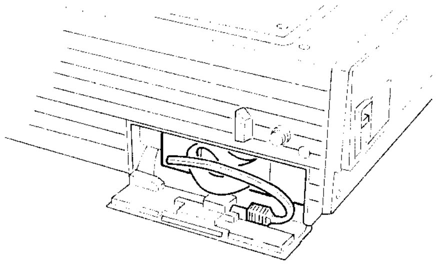
1-4-1. Akku

Einlegen

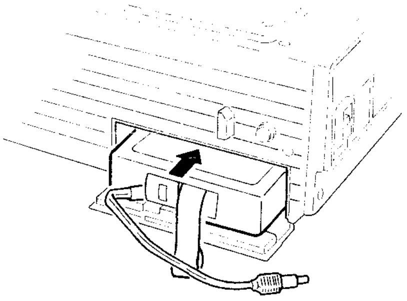
1 Zum Öffnen drücken.



2 Den BP-90 wie abgebildet einlegen.



3 Den Stecker anschließen.



4 Den Deckel schließen.

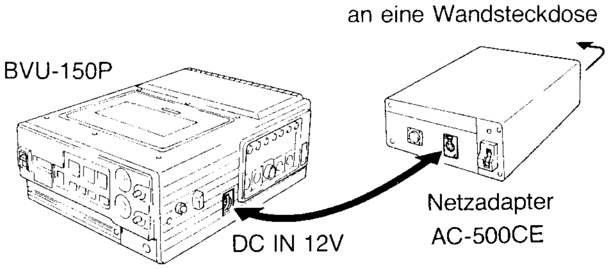
Akku-Betriebsdauer

Bei Normaltemperatur kann ein vollgeladener Akku den BVU-150P zusammen mit der Farb-Videokamera BVP-330AP ca. eine Stunde ununterbrochen versorgen. Wenn ausschließlich der Videorecorder betrieben wird, verlängert sich die Betriebsdauer auf ca. 2 Stunden.

Laden der Batterie

Nach jeder Verwendung sollte der Akku mit einem Ladegerät (z.B. BC-210CE) geladen werden. Genaueres zum Laden entnehmen Sie bitte der Bedienungsanleitung des Ladegeräts.

1-4-2. Netzbetrieb



Hinweise

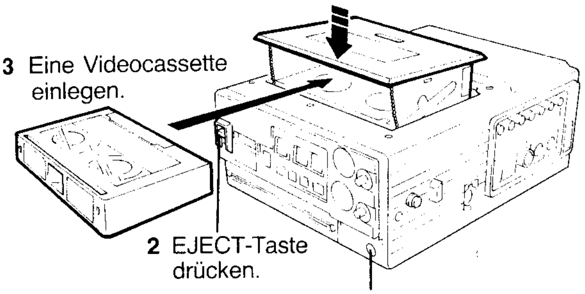
- Wenn der Netzadapter mit dem DC IN 12V-Anschluß verbunden wird, wird die interne Batterie automatisch abgetrennt.
- Während Akkubetrieb darf der Stecker nicht in den DC IN 12V-Anschluß eingesteckt oder von ihm abgetrennt werden, da sich das Band sonst verwickeln kann.

1-5. ZU DEN VIDEOCASSETTEN

1-5-1. Einlegen der Cassette

Verwendbare Cassetten

¾-Zoll-Cassette wie z.B. KSP-S, KCS o.ä.



4 Den Deckel herunterdrücken, bis er einrastet.

3 Eine Videocassette einlegen.

2 EJECT-Taste drücken.

1 POWER-Schalter auf ON stellen.

Hinweis

Wenn der HUMID-Indikator leuchtet, nachdem der POWER-Schalter auf ON gestellt wurde, hat sich Feuchtigkeit im Gerät angesammelt, und es darf keine Cassette eingelegt werden. Schalten Sie in diesem Fall das Gerät aus und warten Sie, bis der HUMID-Indikator beim Einschalten des POWER-Schalters nicht mehr aufleuchtet.

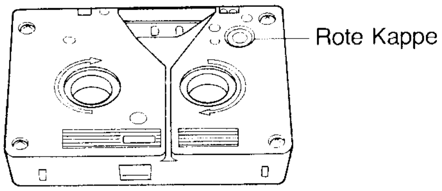
Herausnehmen

Vergewissern Sie sich, daß der Recorder eingeschaltet ist und drücken Sie die EJECT-Taste.

1-5-2. Löschschutzkappe an der Unterseite der Cassette

Die Videocassette 🅂 besitzt eine praktische Löschschutzvorrichtung.

Wird die rote Kappe an der Unterseite der Cassette entfernt, so ist die Cassette gegen versehentliches Aufnehmen geschützt. Um die Cassette später wieder zum Aufnehmen verwenden zu können, setzen Sie einfach die Kappe wieder ein.



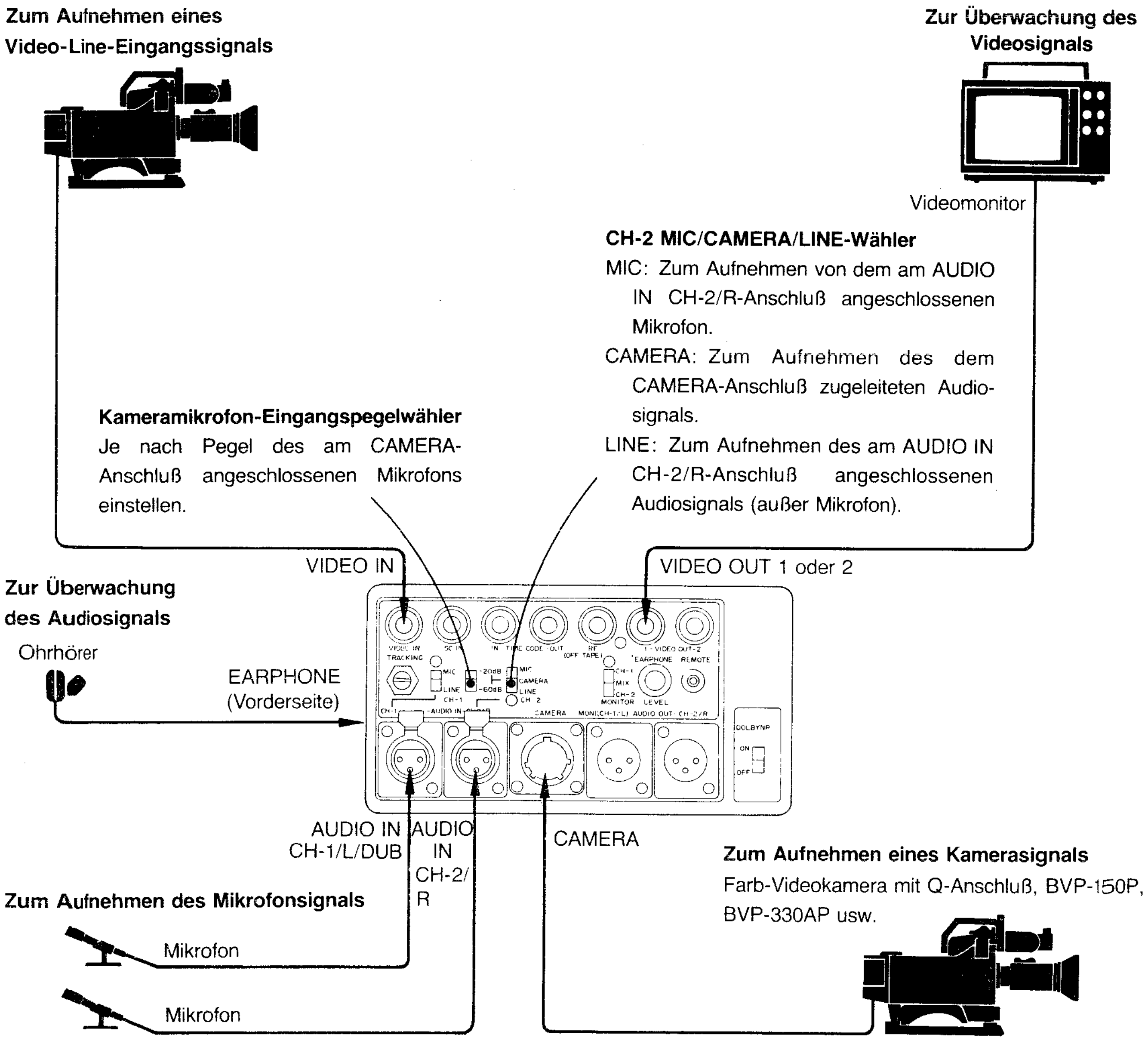
1-5-3. Hinweise zum Behandeln von Cassetten

- Bewahren Sie Cassetten 🅂 stets in ihren Schachteln auf, wenn sie transportiert oder verschickt werden.
- Bewahren Sie die Cassetten-Schachteln senkrecht stehend auf und spulen Sie das Band zuvor auf die Vorratsspule zurück, um eine gleichmäße Aufwicklung sicherzustellen.
- Bewahren Sie die Cassetten nicht in der Nähe von Wärmequellen wie Heizungen oder Warmluftauslässen und auch nicht an Plätzen auf, die direktem Sonnenlicht, hoher Feuchtigkeit, übermäßigem Staub oder starken Magnetfeldern ausgesetzt sind.
- Bewahren Sie die Cassette vor Stößen.

1-6. AUFNAHME

1-6-1. Aufnehmen des Kamerasignals

Anschlüsse



Zum Aufnehmen eines Video-Line-Eingangssignals

Zur Überwachung des Videosignals

CH-2 MIC/CAMERA/LINE-Wähler

MIC: Zum Aufnehmen von dem am AUDIO IN CH-2/R-Anschluß angeschlossenen Mikrofon.

CAMERA: Zum Aufnehmen des dem CAMERA-Anschluß zugeleiteten Audiosignals.

LINE: Zum Aufnehmen des am AUDIO IN CH-2/R-Anschluß angeschlossenen Audiosignals (außer Mikrofon).

Kameramikrofon-Eingangspegelwähler

Je nach Pegel des am CAMERA-Anschluß angeschlossenen Mikrofons einstellen.

Zur Überwachung des Audiosignals

Zum Aufnehmen des Mikrofonsignals

Zum Aufnehmen eines Kamerasignals

Farb-Videokamera mit Q-Anschluß, BVP-150P, BVP-330AP usw.

Hinweis

Schließen Sie entweder am CAMERA- oder VIDEO IN-Anschluß ein Signal an. Wenn beiden Anschlüssen ein Signal zugeleitet wird, kann die Aufnahme nicht einwandfrei ausgeführt werden.

Vorbereitung

Führen Sie die notwendigen Anschlüsse aus und leiten Sie die Video- und Audiosignale zu.

Videoeingangspegel

Dieser Videorecorder ist mit einer automatischen Sync-Pegelregelung (AGC) ausgestattet, so daß keine Videoeingangspegeleinstellung erforderlich ist. Zur Überprüfung des Videopegels stellen Sie den METER SELECT-Schalter auf VIDEO. Der Zeiger der CH-1 LEVEL-Anzeige muß sich bei richtiger Einstellung im blauen Bereich befinden.

Audioaufnahmepegel

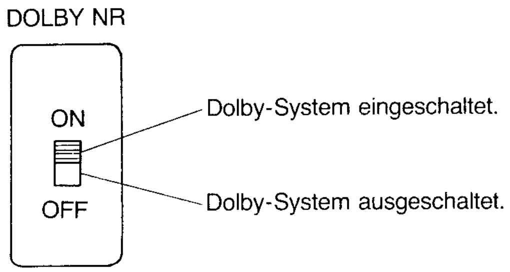
Für automatische Einstellung: Stellen Sie den AUDIO LEVEL-Wähler auf AUTO.

Für manuelle Einstellung:

1 Drücken Sie die REC-Taste, um den Videorecorder auf E-zu-E-Betrieb zu schalten.
2 Stellen Sie den AUDIO LEVEL-Wähler auf MANUAL.
3 Zur Einstellung von Audiokanal 1 stellen Sie den METER SELECT-Schalter auf CH-1.
4 Stellen Sie den Aufnahmepegel von Audiokanal 1 oder 2 am CH-1 bzw. CH-2 LEVEL-Regler so ein, daß der Zeiger der Pegelanzeige maximal bis 0 VU ausschlägt.

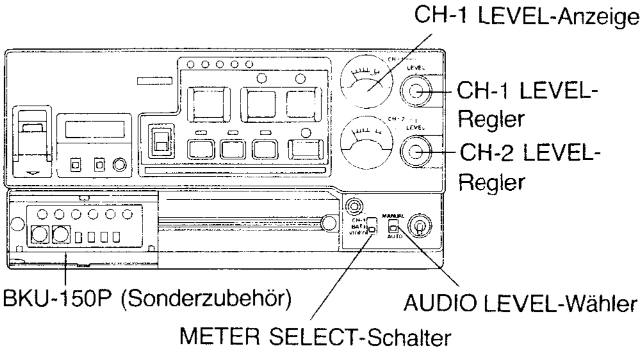
Audiouaufzeichnung mit Dolby-Rauschverminderung

Das Dolby-System kann mit dem DOLBY NR-Schalter am Anschlußfeld ein- und ausgeschaltet werden.



Zeitcode

Bei Anschluß des als Sonderzubehör lieferbaren Zeitcode-Generators BKU-150P kann der Zeitcode (LTC, VITC und Benutzer-Bits) auf Band aufgezeichnet werden. Genauere Information zur Einstellung des Zeitcodes entnehmen Sie bitte der Bedienungsanleitung des BKU-150P.



Bedienungsvorgänge (Kamera an CAMERA-Buchse angeschlossen)

1 Die Videocassette einlegen.
Vergewissern Sie sich, daß die rote Kappe an der Unterseite der Cassette eingesetzt ist.

2 Die REC-Taste gedrückt halten und dann die PLAY-Taste drücken. Der Recorder schaltet dann auf Aufnahme-Bereitschaft.

3 Die Aufnahme durch Drücken der Videorecorder-Start/Stopp-Taste an der Kamera oder der PAUSE-Taste am Recorder starten.

Am Ende der Aufnahme die STOP-Taste am Recorder drücken.

Pause bei Aufzeichnung des Kamerasignals

Um das Band beim Aufnehmen des Kamerasignals kurzzeitig zu stoppen, drücken Sie die Videorecorder-Start/Stopp-Taste an der Kamera oder die PAUSE-Taste am Recorder. Während des Pausenbetriebs leuchtet der PAUSE-Indikator am Recorder und das E-zu-E-Signal wird weiterhin auf dem am Recorder angeschlossenen Monitor angezeigt.
Zum Abschalten der Pause drücken Sie die Videorecorder-Start/Stopp-Taste an der Kamera oder die PAUSE-Taste am Recorder erneut.

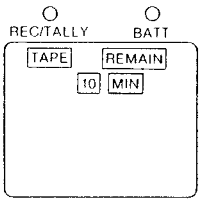
- Wenn die Aufnahme mit der Videorecorder-Start/Stopp-Taste der Kamera gestartet wurde, so kann sie nur mit der Videorecorder-Start/Stopp-Taste gestoppt werden. Mit der PAUSE-Taste am Recorder kann die Aufnahme in diesem Fall nicht gestoppt werden.
  Wenn die Aufnahme dagegen mit der PAUSE-Taste des Recorders gestartet wurde, so kann sie sowohl mit der PAUSE-Taste als auch mit der Videorecorder-Start/Stopp-Taste der Kamera gestoppt werden.
- Bleibt das Gerät länger als acht Minuten auf Pause geschaltet, so spricht der Bandschutzmechanismus an und gibt die Bandspannung frei. Zum Fortsetzen der Aufnahme drücken Sie in diesem Fall die PAUSE-Taste am Recorder oder die Videorecorder-Start/Stopp-Taste an der Kamera. Bei Ansprechen des Bandschutzmechanismus kann es zu Bildstörungen kommen.

Sperrung der Aufnahmestopp-Funktion

Um ein versehentliches Unterbrechen durch Fehlbedienungen zu verhindern, ist der INHIBIT-Schalter vorgesehen. Steht dieser Schalter auf ON, so arbeitet keine Taste außer der EJECT-Taste. Um das Gerät wieder normal bedienen zu können, stellen Sie den INHIBIT-Schalter auf OFF.

Bandrestzeit-Anzeige

Wenn während der Aufnahme die Rücklaufvideotaste der Kamera gedrückt wird, so erscheint die Bandrestzeit im Simultan-Wiedergabebild.



Anzeige	15 MIN	10 MIN	5 MIN	4 MIN	3 MIN	2 MIN	1 MIN	TAPE BEFORE END *	
Bandrestzeit	20	15	10	5	4	3	2	1,5	0 Min.

* Die Anzeige verschwindet.

Kontrolle des aufgezeichneten Videosignals (Simultan-Wiedergabebild)

Durch Drücken der Rücklaufvideotaste an der Kamera kann überprüft werden, ob die Aufnahme einwandfrei ausgeführt wird. Während diese Taste gedrückt ist, erscheint ein Simultan-Wiedergabebild mit eingeblendeter Bandrestzeit-Anzeige im Sucher.

Wenn das Band bei Aufnahmebetrieb nicht läuft

Das Band läuft nur, wenn ein Videosignal zugeleitet wird. Sollte sich das Band nicht bewegen, so überprüfen Sie zunächst den Ausschlag der CH-1 LEVEL-Anzeige. Wenn der METER SELECT-Schalter auf VIDEO steht, so befindet sich der Zeiger bei ausreichender Videosignalstärke im blauen Bereich.

Line-Video-Aufnahme mit einer Kamera oder einem anderen Videogerät (an VIDEO IN-Buchse angeschlossen)

1 Eine Videocassette einlegen.
Überprüfen, ob die rote Kappe an der Unterseite der Cassette eingesetzt ist.

↓

2 Zum Starten der Aufnahme die REC-Taste gedrückt halten und dann die PLAY-Taste drücken.

↓

3 Zum kurzzeitigen Anhalten der Aufnahme die PAUSE-Taste am Recorder drücken. Zum Abschalten des Pausenbetriebs die PAUSE-Taste erneut drücken.

↓

Am Ende der Aufnahme die STOP-Taste am Recorder drücken.

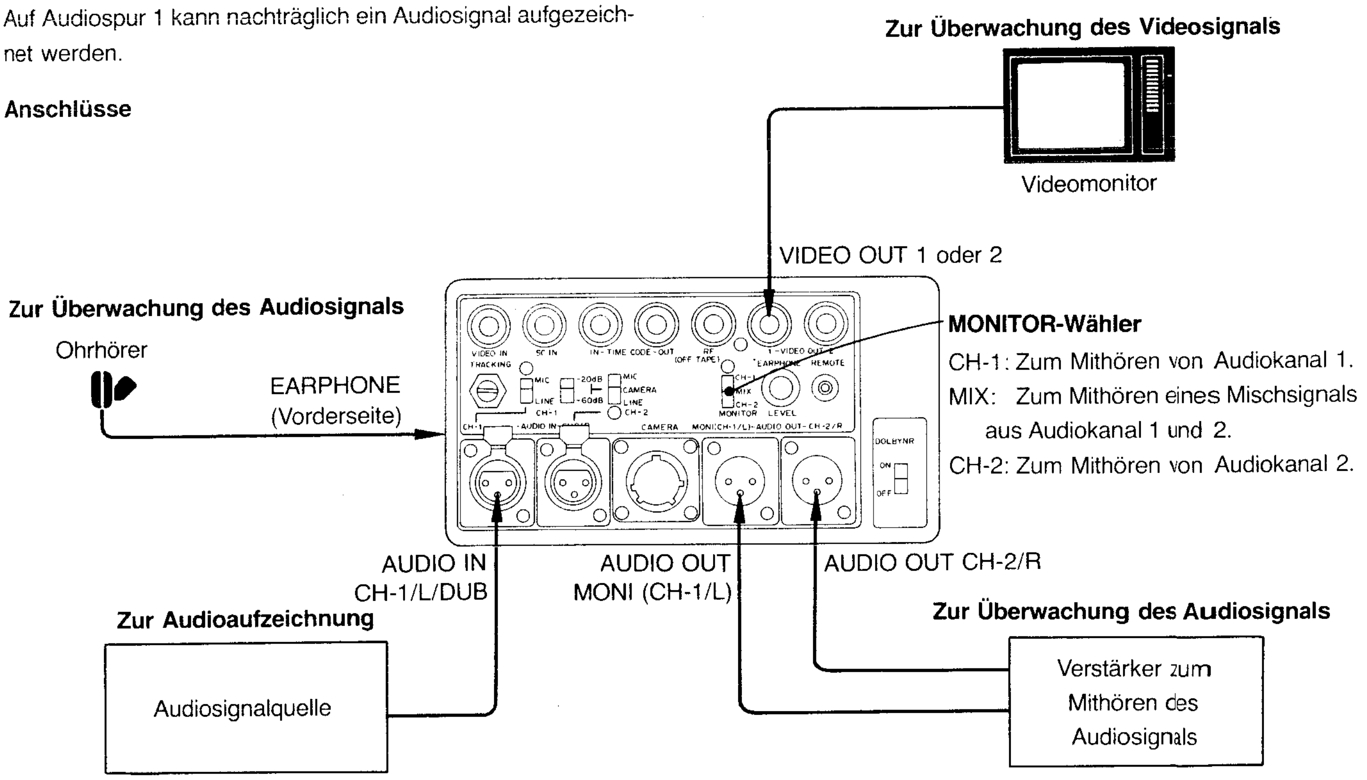
HINWEISE

- Die Videorecorder-Start/Stopp-Taste an der Kamera arbeitet nicht.
- Eine Anzeige der Bandrestzeit und des Simultan-Wiedergabebildes (bei Drücken der Rücklaufvideotaste an der Kamera) ist nicht möglich.

1-6-2. Nachvertonung

Auf Audiospur 1 kann nachträglich ein Audiosignal aufgezeichnet werden.

Anschlüsse



Bedienungsvorgänge

1 Die Videocassette einlegen.
Vergewissern Sie sich, daß die rote Kappe an der Unterseite der Cassette eingesetzt ist.

2 Den Audioaufnahmepegel einstellen.
Für automatische Pegeleinstellung
AUDIO LEVEL-Wähler auf AUTO stellen.
Für manuelle Einstellung
1) AUDIO LEVEL-Wähler auf MANUAL stellen.
2) METER SELECT-Schalter auf CH-1 stellen.
3) AUDIO DUB-Taste drücken.
4) Den Aufnahmepegel von Audiokanal 1 am CH-1 LEVEL-Regler so einstellen, daß der Zeiger der Pegelanzeige maximal bis 0 VU ausschlägt.

3 Den DOLBY NR-Schalter am Anschlußfeld auf ON stellen, wenn das Signal von Audiokanal 2 mit Dolby aufgezeichnet wurde bzw. wenn das Signal mit Dolby aufgezeichnet werden soll.

4 Das Band unter Beobachtung des Bildes wiedergeben.

5 Sobald die gewünschte Stelle gefunden ist, die PAUSE-Taste drücken.

6 Die AUDIO DUB-Taste drücken.

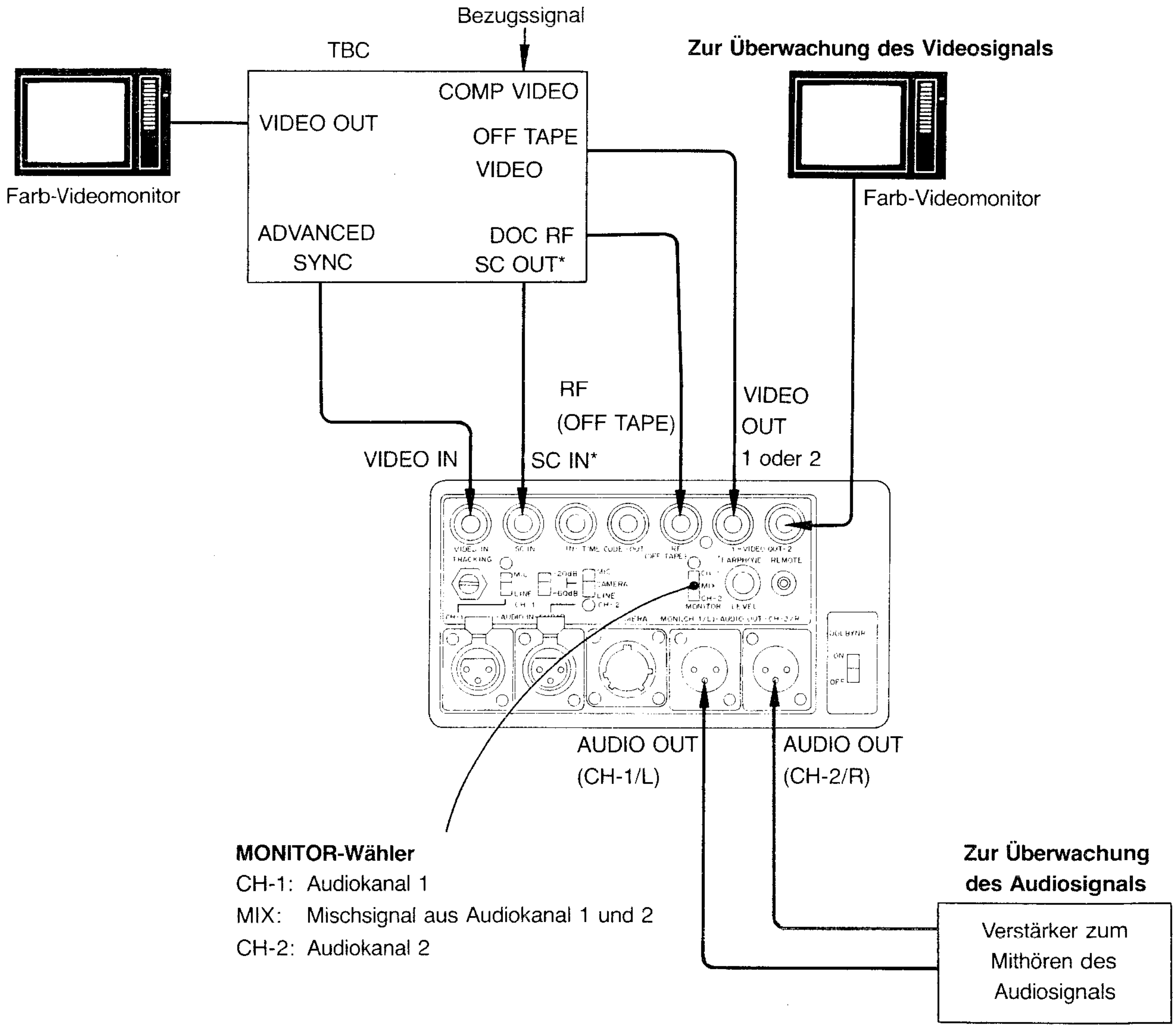
7 Die PAUSE-Taste erneut drücken. Der Pausenbetrieb wird abgeschaltet, und die Audioaufzeichnung beginnt.

8 Am Ende der Aufzeichnung die STOP-Taste drücken.

1-7. WIEDERGABE

1-7-1. Anschlüsse

Anschluß mit einem Time-Base-Corrector (TBC)



MONITOR-Wähler
CH-1: Audiokanal 1
MIX: Mischsignal aus Audiokanal 1 und 2
CH-2: Audiokanal 2

* Dieser Anschluß wird benötigt, wenn ein TBC, der ein Hilfsträger-Eingangssignal benötigt, verwendet wird (z.B. BVT-2000P). Bei anderen TBCs wird der Anschluß nicht benötigt.

1-7-2. Bedienungsvorgänge

1 Die bespielte Videocassette einlegen.

↓

2 Den DOLBY NR-Schalter auf ON stellen, wenn das Band mit Dolby bespielt wurde.

↓

3 Die PLAY-Taste drücken. Die Wiedergabe beginnt.

↓

4 Zum Stoppen der Wiedergabe die STOP-Taste drücken.

Bildsuchlauf

Durch Drücken der F FWD- oder REW-Taste kann ein bestimmtes Bild leicht aufgefunden werden. Das Bild enthält in diesem Fall einen Störstreifen vom Spurrasen.

Kurzzeitiges Stoppen der Wiedergabe

Drücken Sie die PAUSE-Taste. Das Gerät liefert nun ein Standbild. Je nach Monitor kann das Bild schwarzweiß werden oder einen falschen Farbton aufweisen.

- Bleibt das Gerät länger als acht Minuten auf Pause geschaltet, so spricht der Bandschutzmechanismus an und gibt die Bandspannung frei. Zum Fortsetzen der Aufnahme drücken Sie in diesem Fall die PAUSE-Taste.

Spurlageneinstellung

Wenn das Wiedergabebild eines Bandes, das auf einem anderen Videorecorder aufgezeichnet wurde, durch Streifen oder Schnee gestört ist, justieren Sie den TRACKING-Regler mit einem Schraubenzieher auf optimale Bildqualität ein.

Nach der Wiedergabe des betreffenden Bandes stellen Sie den TRACKING-Regler in die einrastende Mittelstellung zurück.

Lesen des Zeitcodes

Bei Anschluß des als Sonderzubehör lieferbaren Zeitcode-Generators BKU-150P wird der auf Band aufgezeichnete Zeitcode ausgelesen und im Zeitzähler angezeigt. Der gelesene Zeitcode kann auch am TIME CODE OUT-Anschluß abgegriffen werden.

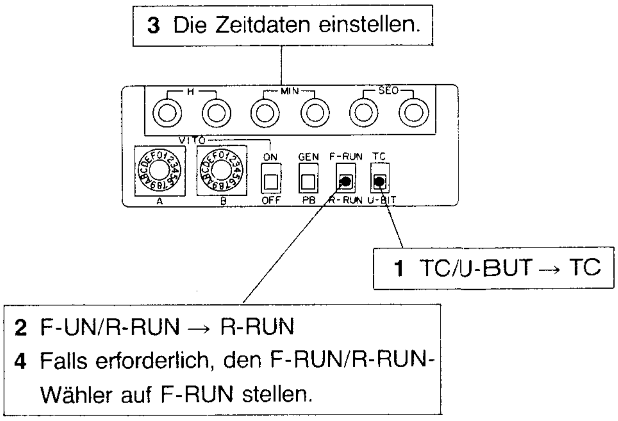
Beim Vor- und Zurückspulen wird der bei der normalen Wiedergabe als letztes gelesene Zeitcode im Zeitzähler gehalten. Sobald die Wiedergabe fortgesetzt wird, zeigt der Zeitzähler wieder die vom Band gelesenen Daten.

1-8. ZEITCODE

Bei Anschluß des als Sonderzubehör lieferbaren Zeitcode-Generators BKU-150P wird ein Zeitcodesignal erzeugt und zusammen mit dem Videosignal auf Band aufgezeichnet. Genaueres zum Anbringen des BKU-150P und zum Einstellen der Daten entnehmen Sie bitte der Bedienungsanleitung des BKU-150P.

1-8-1. Einstellen der Daten

Zeitdaten



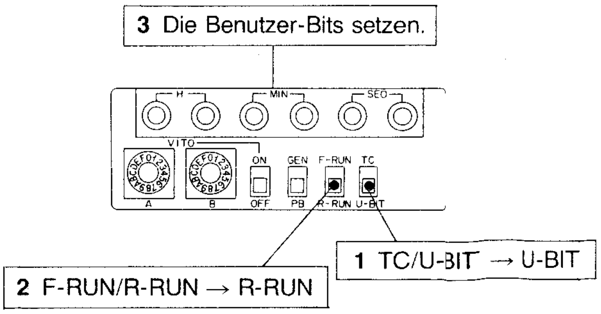
3 Die Zeitdaten einstellen.

1 TC/U-BUT → TC

2 F-UN/R-RUN → R-RUN

4 Falls erforderlich, den F-RUN/R-RUN-Wähler auf F-RUN stellen.

Benutzer-Bits



3 Die Benutzer-Bits setzen.

1 TC/U-BIT → U-BIT

2 F-RUN/R-RUN → R-RUN

Die Zeitdaten und Benutzer-Bits können nacheinander gesetzt werden. Wenn in diesem Fall der Zeitcode im F-RUN-Betrieb (Freilauf) verwendet werden soll, setzen Sie zunächst die Benutzer-Bits und dann die Zeitdaten, bevor Sie schließlich den F-RUN/R-RUN-Wähler auf F-RUN stellen.

Halten des Zeitcodes beim Batteriewechsel

Durch die Pufferbatterie wird der Zeitcode beim Batteriewechsel ca. eine Minute lang gehalten.

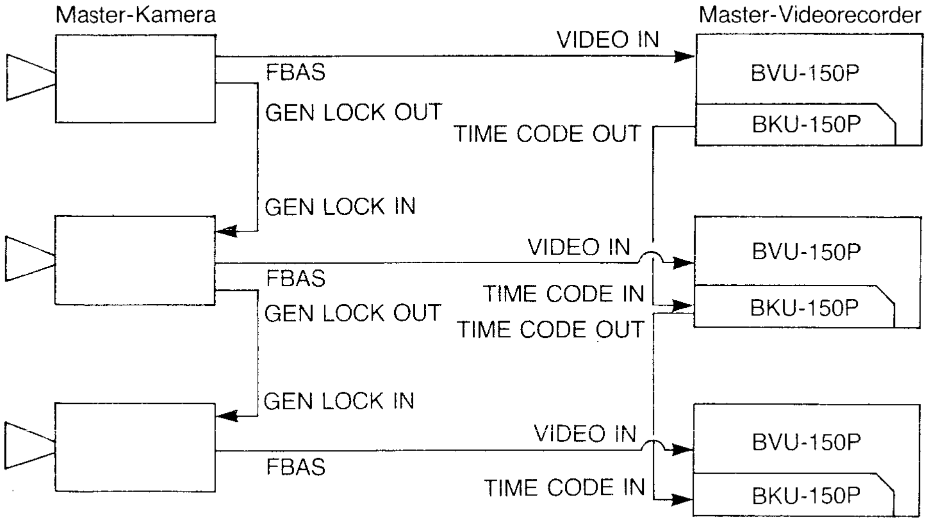
1-8-2. Zeitcode-Synchronverkopplung

Der am BVU-150P angeschlossene BKU-150P kann mit einem externen Zeitcode-Generator synchronverkoppelt werden, wenn der externe Zeitcode mit dem Videoeingangssignal synchronisiert ist.

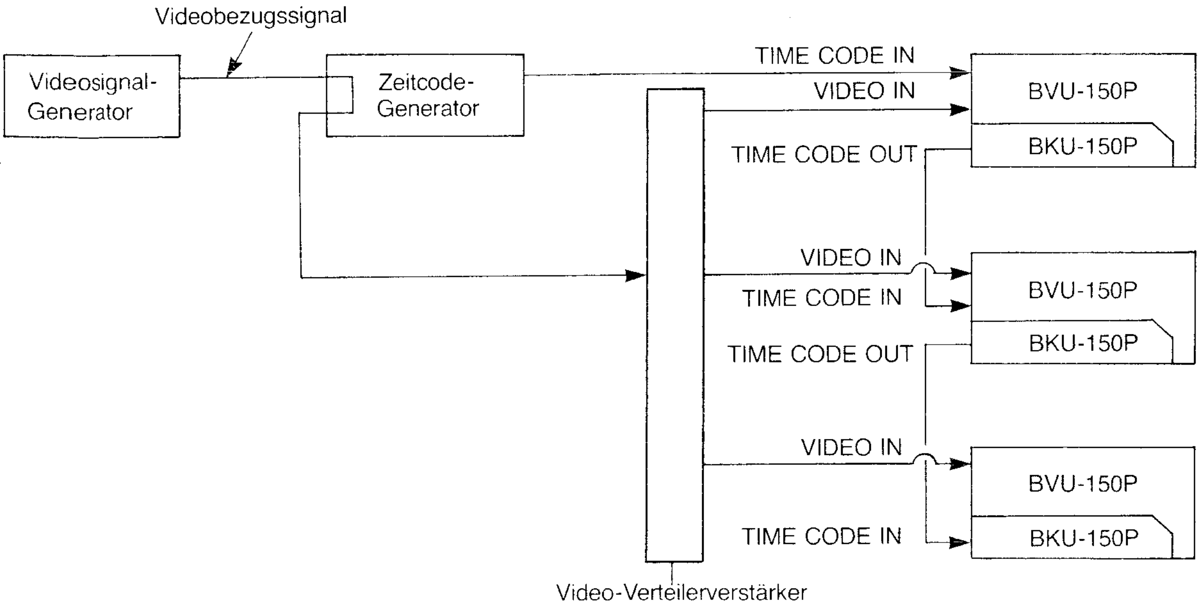
Hinweise

- Zur Zeitcode-Synchronverkopplung sind die Schalter wie folgt einzustellen:
  CTL/TC-Wähler des BVU-150P: TC
  GEN/PB- Wähler des BKU-150P: GEN
  F-RUN/R-RUN-Wähler des BKU-150P: F-RUN
- Auch die Benutzer-Bits können mit den Master-Benutzer-Bits verkoppelt werden, wenn eine Brücke auf der internen Leiterplatte angebracht wird. Genaueres dazu entnehmen Sie bitte Teil 2.

Anschlußbeispiel 1: Verkopplung des Zeitcode-Generators BKU-150P mit einem Master-BKU-150P

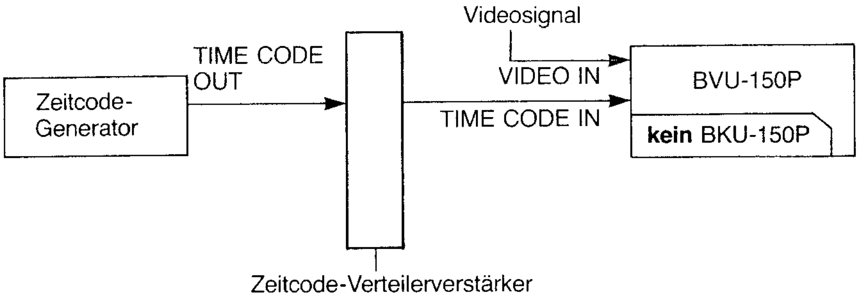


Anschlußbeispiel 2: Verkopplung des Zeitcode-Generators BKU-150P mit einem externen Zeitcode-Generator.



1-8-3. Aufnehmen des Zeitcodes ohne Zeitcode-Generator BKU-150P

Anschlußbeispiel



Hinweise

- Der Phasenzusammenhang zwischen dem Bezugs-Zeitcode und dem Bezugs-Videosignal muß den EBU-Zeitcode-Standard erfüllen.
- Nachdem der Zeitcode synchronisiert ist, warten Sie einige Sekunden, bis der Synchronsignal-Generator der Kamera stabil arbeitet, und schalten Sie erst dann den Videorecorder auf Aufnahme.
- Wenn der Zeitcode synchronisiert ist, können die TIME CODE OUT- und TIME CODE IN-Anschlüsse der Videorecorder verbunden werden. Wenn in diesem Fall die Kamera nicht an den Videorecorder angeschlossen ist, eilt der Zeitcode dem Taktimpuls voraus.

1-9. WARNSYSTEM

Während der Aufnahme werden dem Bedienungspersonal durch Warn-Indikatoren, Ohrhörer-Warntöne und Kamera-Signallampen (bei Verwendung eines Anschlusses vom Q-Typ) folgende Zustände signalisiert.

Warn-Indikatoren		Ohrhörer-Warnton	Zustand	Kamera-Signallampen		Videorecorder-Betrieb
Indikator	Betrieb			REC/TALLY	BATT*2	
SERVO*1	◔ (Während der Aufnahme)	∧∧∧ ∧∧∧ ∧∧∧ ∧∧∧	Abnormalität des Servo	◔		Die Aufnahme wird fortgesetzt. Die Aufnahme wird möglicherweise nicht ausgeführt.
HUMID	○ (In allen Betriebsfunktionen)	∧∧∧ ∧∧∧ ∧∧∧ ∧∧∧	Feuchtigkeits-ansammlung	◔		Die Aufnahme wird fortgesetzt, wenn der Recorder auf Aufnahme geschaltet ist und das Band nicht an der Kopftrommel festklebt. Wenn das Band an der Kopftrommel festklebt oder das Gerät sich in einer anderen Betriebsfunktion befindet, so schaltet der Recorder in die Stopp-Funktion. Nehmen Sie die Cassette durch Drücken der EJECT-Taste heraus.
SLACK	◔ (In allen Betriebsfunktionen)	∧∧∧∧∧∧∧∧∧∧	Lockeres Band	◔		Die Aufnahme stoppt. Nehmen Sie die Cassette durch Drücken der EJECT-Taste heraus. Wenn sich das Cassettenfach nicht hebt, lassen Sie den Recorder eingeschaltet und wenden Sie sich an den nächsten Sony Händler.
TAPE END	◒ (Während der Aufnahme)	∧∧∧	Bandende fast erreicht	◒		Die Aufnahme wird fortgesetzt.
	○*3 (In allen Betriebsfunktionen)	∧∧∧∧∧∧∧∧∧∧*3	Bandende	◔*3		Die Aufnahme stoppt. Wechseln Sie die Cassette.
BATTERY	◒ (In allen Betriebs-funktionen)	∧∧∧ (Während der Aufnahme)	Bandende fast erreicht	◒	◒	Die Aufnahme wird fortgesetzt.
	○ (In allen Betriebsfunktionen)	∧∧∧∧∧∧∧∧∧∧	Entladung	◔	○	Die Aufnahme stoppt. Wechseln Sie die Batterien.

Bedeutung der Symbole

Lampen	Warnton
◔ Blinken mit 4 Hz	∧∧∧ Intervall von 1 Sekunde
◒ Blinken mit 1 Hz	∧∧∧ ∧∧∧ ∧∧∧ Intervall von ¼ Sekunde
○ Konstantes Leuchten	∧∧∧∧∧∧∧∧ Konstanter Ton

*1 Wenn der Servo-Indikator blinkt, überprüfen Sie die Anschlüsse.

*2 Der BATT-Indikator leuchtet, wenn die Akkubatterie des Videorecorders oder die Akkubatterie der Kamera erschöpft ist.

*3 Sobald die Aufnahme stoppt, gehen die Lampen aus, und der Warnton wird abgeschaltet.

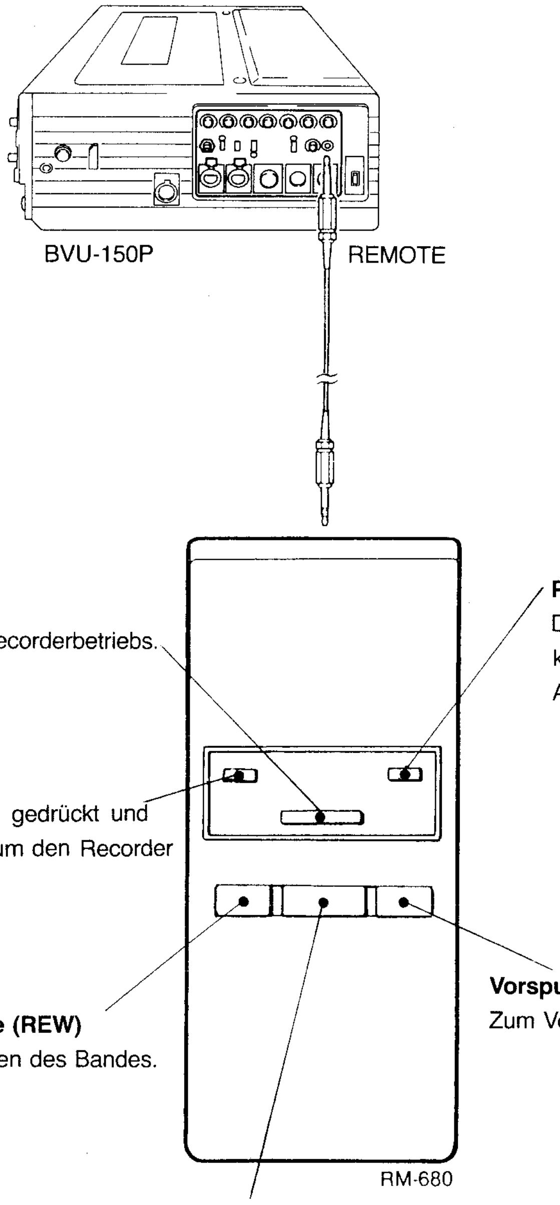
Hinweis zur Feuchtigkeitsansammlung

Wenn der Recorder direkt von einem kalten an einen warmen Ort gebracht wird oder in sehr feuchter Umgebung betrieben wird, kann sich Feuchtigkeit an der Kopftrommel ansammeln. In diesem Fall besteht die Gefahr, daß das Band an der Kopftrommel festklebt und beschädigt wird. Zur Vermeidung derartiger Probleme beachten Sie folgende Punkte.

- Wenn der Recorder direkt von einem kalten an einen warmen Ort gebracht wird, nehmen Sie auf jeden Fall die Cassette heraus.
- Vor dem Einlegen einer Cassette stellen Sie den POWER-Schalter auf ON und stellen Sie sicher, daß der HUMID-Indikator beim Einschalten nicht mehr leuchtet.
- Hat sich Feuchtigkeit an der in den Videorecorder eingesetzten Cassette angesammelt, so verfahren Sie wie folgt:
  Steht der POWER-Schalter auf OFF, dann stellen Sie den POWER-Schalter auf ON. Drücken Sie die EJECT-Taste zum Herausnehmen der Cassette. Schalten Sie das Gerät dann aus und warten Sie im ausgeschalteten Zustand, bis der HUMID-Indikator nicht mehr leuchtet, wenn das Gerät eingeschaltet wird.

1-10. FERNBEDIENUNG

Bei Verwendung der Einheit RM-680 (Sonderzubehör) kann das Gerät bis zu fünf Metern fernbedient werden.



Stopptaste (STOP)
Zum Stoppen des Recorderbetriebs.

Pausentaste (PAUSE)
Drücken Sie diese Taste zum kurzzeitigen Anhalten des Bandes bei Aufnahme oder Wiedergabe.

Aufnahmetaste (REC)
Halten Sie die PLAY-Taste gedrückt und drücken Sie diese Taste, um den Recorder auf Aufnahme zu schalten.

Vorspultaste und Indikator (F FWD)
Zum Vorspulen des Bandes.

Rückspultaste (REW)
Zum Rückspulen des Bandes.

Wiedergabetaste (PLAY)
Zum Wiedergeben des Bandes. Zum Starten der Aufnahme drücken Sie diese Taste, während Sie gleichzeitig die REC-Taste gedrückt halten.

1-11. REINIGUNG DER VIDEOKÖPFE

Wenn die Videoköpfe verschmutzt sind, so verschwindet das Bild manchmal ganz oder es sind Schnee oder Streifen auf dem Monitorschirm zu sehen. Reinigen Sie dann die Videoköpfe mit der Reinigungscassette KCS-1C (Sonderzubehör). Legen Sie die Reinigungscassette ein und schalten Sie den Recorder durch gleichzeitiges Drücken der REC- und PLAY-Tasten auf Aufnahme. Drücken Sie nach 30 Sekunden die STOP-Taste.

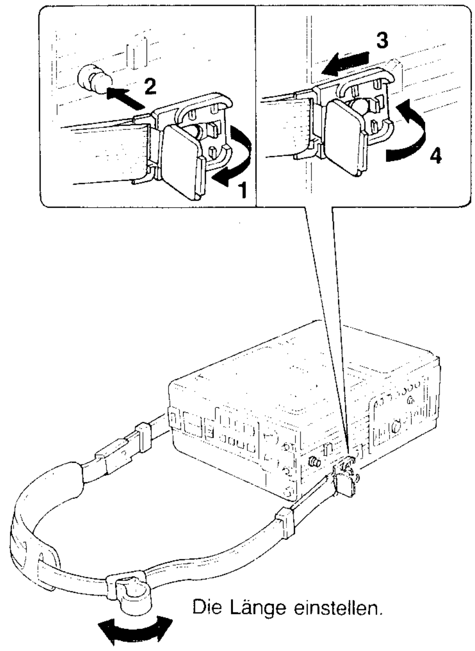
Hinweise

- Verwenden Sie die Reinigungscassette nur dann, wenn aufgrund der Bildqualität eindeutig auf verschmutzte Videoköpfe geschlossen werden kann und lassen Sie die Cassette pro Reinigung nicht länger als 30 Sekunden lang laufen. Übermäßige Verwendung der Reinigungscassette verkürzt die Lebensdauer der Videoköpfe.
- Spulen Sie die Reinigungscassette nicht nach jeder Verwendung zurück. Spulen Sie sie erst dann zurück, wenn sie bis zum Ende durchgelaufen ist.
- Reinigungscassetten können mehrfach verwendet werden, obwohl sie nach und nach in ihrer Wirkung nachlassen.

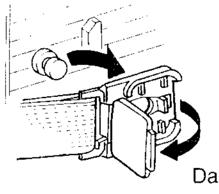
1-12. MITGELIEFERTES ZUBEHÖR

1-12-1. Schulterriemen

Der mitgelieferte Schulterriemen kann am Videorecorder angebracht werden, so daß dieser bequem an der Schulter getragen werden kann. Befestigen Sie die Enden des Schulterriemens an den Befestigungsknöpfen an beiden Seiten des Recorders.



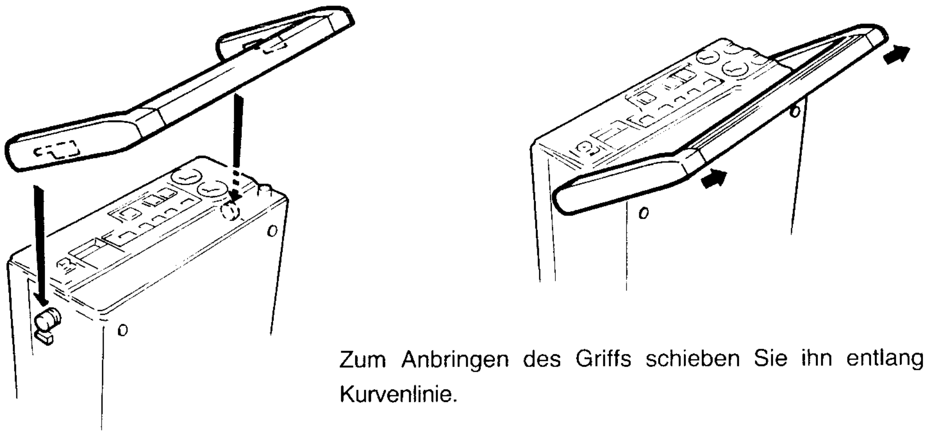
Zum Abnehmen



1-12-2. Tragegriff

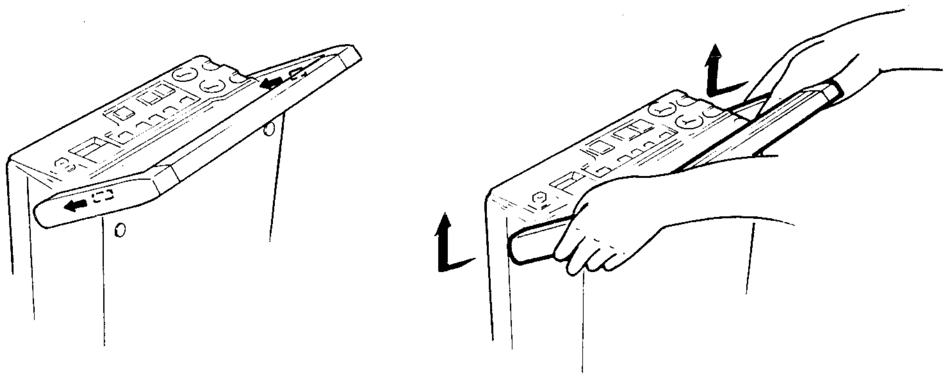
Der mitgelieferte Tragegriff kann wie unten gezeigt am Videorecorder angebracht werden.

Zum Anbringen

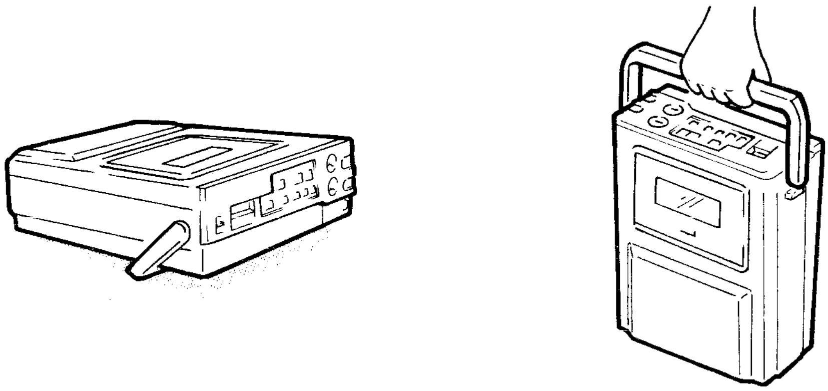


Zum Anbringen des Griffs schieben Sie ihn entlang der Kurvenlinie.

Zum Abnehmen

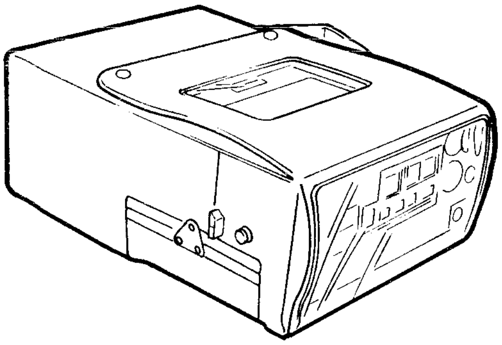


Zur Verwendung



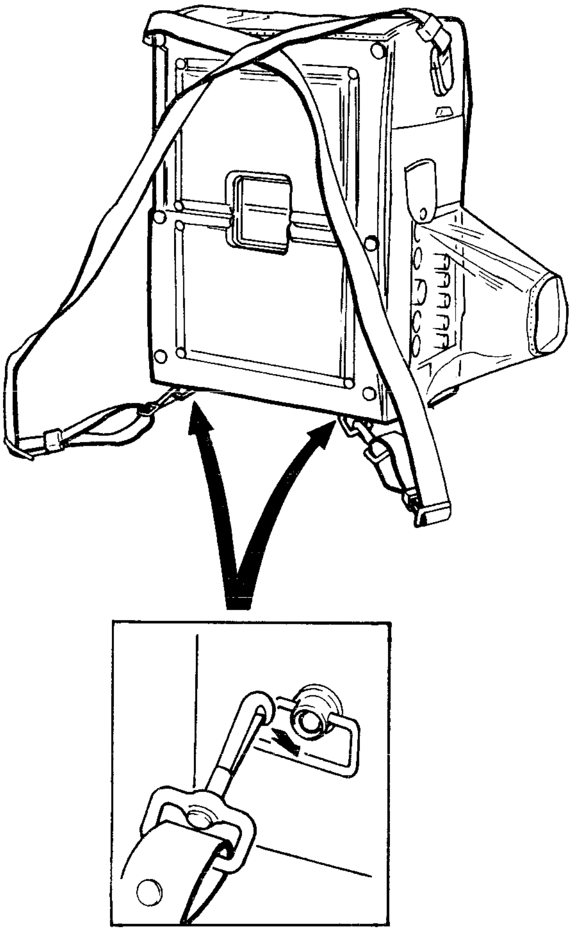
1-12-3. Weiche Tragetasche

In der mitgelieferten Tragetasche ist der Recorder gegen Regen und Staub geschützt.



1-12-4. Tragegurte

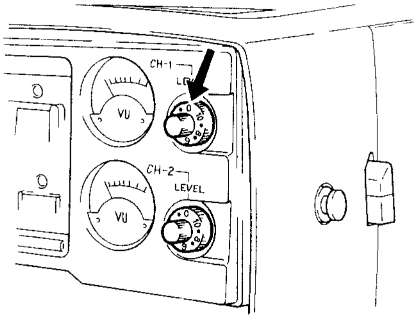
Mit den mitgelieferten Tragegurten und der mitgelieferten weichen Tragetasche kann der Videorecorder bequem auf dem Rücken getragen werden.



1-12-5. Auswechseln der Pegelreglerknöpfe

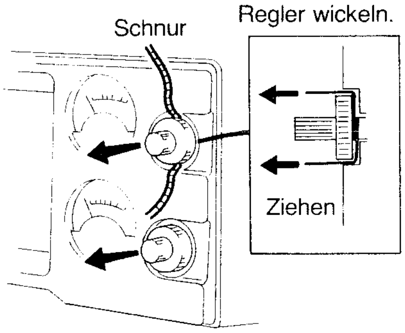
Statt der vorhandenen CH-1 LEVEL- und CH-2 LEVEL-Reglerknöpfe können die mitgelieferten flachen Knöpfe angebracht werden.

1. Drehen Sie den Regler auf „0“.

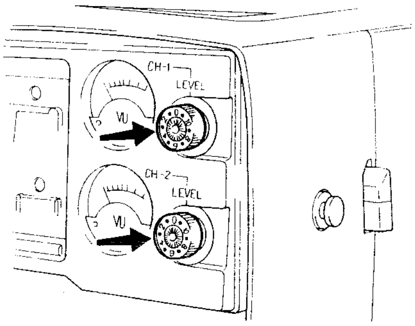


2. Wickeln Sie wie unten gezeigt eine Schnur um den Regler und ziehen Sie.

Die Schnur zweifach um den Regler wickeln.



3. Drücken Sie den mitgelieferten flachen Knopf hinein.



1-13. TECHNISCHE DATEN

Mechanische Daten

Stromversorgung	12 V $^{+2}_{-1}$ V Akku BP-90 (Ni-Cd, 3,5 Ah) Netzbetrieb mit Netzadapter AC-500CE
Leistungsaufnahme	unter 20 W bei Gleichspannungsbetrieb
Anschlüsse	VIDEO IN: BNC-Typ, × 1 CAMERA: Q-Typ, 14pol, × 1 VIDEO OUT 1 und 2: BNC-Typ, je 1 AUDIO IN CH-1/L/DUB und AUDIO IN CH-2/R: XLR-Typ, Buchse, je 1 AUDIO OUT MONI (CH-1/L) und AUDIO OUT CH-2/R: XLR-Typ, Stecker, je 1 SC IN: BNC-Typ, × 1 TIME CODE IN: BNC-Typ, × 1 TIME CODE OUT: BNC-Typ, × 1 RF (OFF TAPE): BNC-Typ, × 1 DC IN 12 V: XLR-Typ, × 1 REMOTE: Spezial-Minibuchse, × 1 EARPHONE: Minibuchse
Betriebsposition	vertikal oder horizontal
Betriebstemperatur	0°C bis 40°C
Lagertemperatur	−20°C bis +60°C
Betriebsfeuchtigkeit	unter 85% (relative Feuchtigkeit)
Abmessungen	ca. 263 × 139 × 355 mm (B/H/T) ausschl. vorspringender Teile und Bedienungselemente
Gewicht	ca. 6,8 kg

Video

Videokopf	4 rotierende Köpfe (A/W: 2, Simultan-Wiedergabe: 2)
Videoaufzeichnungssystem	Luminanz: FM Chrominanz: heruntergesetzter Träger
Videosignalsystem	CCIR-Norm, PAL-Farbsystem
Eingang	FBAS, Video positiv, 1,0 Vss ± 0,3 V, 75 Ohm, unsymmetrisch
Ausgang	FBAS, Video positiv, 1,0 Vss ± 0,2 V, 75 Ohm, unsymmetrisch
Horizontalauflösung	SP-Betrieb: 300 Zeilen (Schwarzweiß/Farbe) Herkömmlicher Betrieb: 260 Zeilen (Schwarzweiß/Farbe)
Signal- Rauschabstand	SP-Betrieb: über 45 dB (Farbe) Herkömmlicher Betrieb: über 45 dB (Farbe)
K-Faktor (2T-Impuls)	SP-Betrieb: unter 4%

Audio

Eingang	CAMERA (Mikrofon-Eingang): Kanal 2, −20 dB/−60 dB umschaltbar, Impedanz über 3 kOhm, symmetrisch AUDIO IN CH-1/L/DUB und AUDIO IN CH-2/R: Line-Eingang: +4 dB, Impedanz über 10 kOhm, symmetrisch Mikrofon-Eingang: −60 dB, Impedanz über 3 kOhm, symmetrisch
Ausgang	AUDIO OUT MONI (CH-1/L) und AUDIO OUT CH-2/R: +4 dB (bei 600 Ohm Last), symmetrisch EARPHONE: −33 bis −20 dB (bei 8 Ohm Last), einstellbar
Signal- Rauschabstand	über 50 dB (bei 3% Klirr)
Frequenzgang	SP-Betrieb: 50 Hz bis 15 kHz ±3 dB Herkömmlicher Betrieb: 50 Hz bis 15 kHz ±4 dB

Bandtransport

Bandgeschwindigkeit	9,53 cm/s
Gleichlaufschwankungen	±0,2% DIN
Aufnahmezeit	20 Min. durchgehend mit KCS-20/KSP-S20, 10 Min. durchgehend mit KCS-10/KSP-S10
Umspulzeit	unter 3 Min. (KCS-20/KSP-S20)
Betriebszeit	ca. 1 Stunde durchgehend mit vollgeladenem Akku BP-90 und angeschlossener Kamera BVP-330AP
Kompatibilität	voll kompatibel mit allen konventionellen U-matic H-Aufnahme/ Wiedergabegeräten
Verwendbare Bänder	KCS- und KSP-S-Typ

Spezialfunktionen

Simultan-Wiedergabebild und Anzeige der Bandrestzeit	Bei Verwendung einer Kamera mit Rücklaufvideo-Funktion
Pause	möglich
Suchlauf	möglich (ca. 10fache Normalgeschwindigkeit in Vorwärts- und Rückwärtsrichtung)
Schneiden	Audio-Schnittmöglichkeit
Spurlagenregelung	möglich
Fernbedienung	Aufnahme, Wiedergabe, Vorspulen, Rückspulen, Pause und Stopp mit Fernsteuereinheit RM-680 (Sonderzubehör)

Zeitcode

Eingang	0,5 bis 5 Vss, 10 kOhm, unsymmetrisch
Ausgang	0 dB ±3 dB, niedrige Impedanz, unsymmetrisch (0 dB = 1,55 Vss Impuls)
HT-Eingang	2 Vss ±1 V, 75 Ohm, unsymmetrisch
HF-Ausgang	0,5 Vss ±0, 1V, 75 Ohm, unsymmetrisch

Mitgeliefertes Zubehör

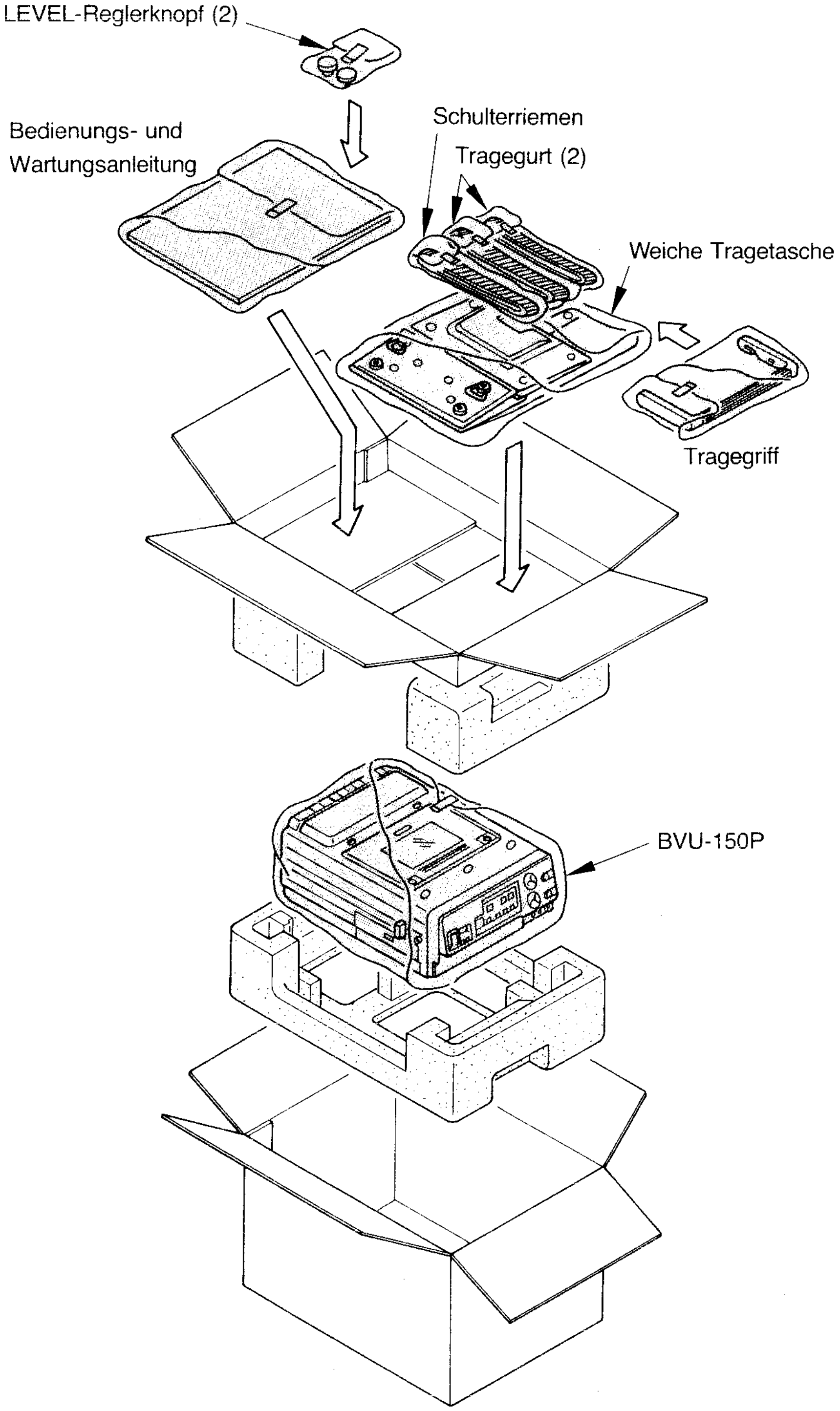
Schulterriemen (1)
Tragegurt (2)
Tragegriff (1)
Weiche Tragetasche (1)
LEVEL-Reglerknopf (2)
Bedienungs- und Wartungsanleitung (1)

Sonderzubehörteile

Netzadapter AC-500CE
Batterieladegerät BC-210CE
Fernbedieneinheit RM-680
Akku BP-90
Videocassetten der KCS- und KSP-S-Serien
Reinigungscassette KCS-1C

Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

1-14. VERPACKUNG



SECTION 2
TECHNICAL INFORMATION

2-1. SPECIFICATIONS

Mechanical

Power requirements	12 V +2, -1 V BP-90 battery pack (Ni-Cd, 3.5 Ah) AC power source operation possible using the AC-500CE ac power adaptor
Power consumption	Less than dc 20 W
Connectors	
VIDEO IN	: BNC type
CAMERA	: Q type, 14-pin
VIDEO OUT 1 and 2	: BNC type
AUDIO IN CH-1/L/DUB and AUDIO IN CH-2/R	: XLR type, female
AUDIO OUT MONI (CH-1/L) and AUDIO OUT CH-2/R	: XLR type, male
SC IN	: BNC type
TIME CODE IN	: BNC type
TIME CODE OUT	: BNC type
RF (OFF TAPE)	: BNC type
DC IN 12V	: XLR type
REMOTE	: Special mini jack
EARPHONE	: Mini jack
Operating position	Both vertical and horizontal
Operating temperature	0°C to 40°C
Storage temperature	-20° C to +60° C
Operating humidity	Less than 85 % (relative humidity)
Dimensions	Approx. 263 x 139 x 355 mm (w/h/d) not incl. projecting parts and controls
Weight	Approx. 6.8 kg

Video

Video head	Rotary 4 heads (R/P: 2, Simultaneous playback: 2)
Video recording system	
Luminance	: FM
Chrominance	: SC low-range conversion
Video signal sytem	CCIR-standards, PAL color signal
Input	
VIDEO IN	Composite, sync negative, 1.0 V(p-p) ± 0.3 V, 75 ohms, unbalanced
Output	
VIDEO OUT 1 and 2	Composite, sync negative, 1.0 V(p-p) ± 0.2 V, 75 ohms, unbalanced
Horizontal resolutions	SP mode : 300 lines (monochrome/color mode) Conventional mode : 260 lines (monochrome/color mode)
Signal-to-noise ratio	SP mode : More than 45 dB (color mode) Conventional mode : More than 45 dB (color mode)
K-factor (2T pulse)	SP mode : Less than 4 %

Audio

Input	
CAMERA (microphone input)	: Channel 2, -20 dB/-60 dB switchable, more than 3k ohms impedance, balanced
AUDIO IN CH-1/L/DUB and AUDIO IN CH-2/R	: Line input : +4 dB, more than 10k ohms impedance, balanced
Microphone input	: -60 dB, more than 3k ohms impedance, balanced
Output	
AUDIO OUT MONI (CH-1/L) and AUDIO OUT CH-2/R	: +4 dB (at 600 ohms load), balanced
EARPHONE	: -33 to -20 dB (at 8 ohms load), adjustable
Signal-to-noise ratio	Better than 50 dB (at 3 % distortion)
Frequency response	SP mode : 50 Hz to 15k Hz ± 3 dB Conventional mode : 50 Hz to 15k Hz ± 4 dB

Tape transport

Tape speed	9.53 cm/sec.
Wow and flutter	±0.2 % DIN
Recording time	20 min. continuously with KCS-20/KSP-S-20, 10 min. continuously with KCS-10/KSP-S-10
Rewind and fast forward time	Within 3 min. (KCS-20/KSP-S-20)
Operating time	Approx. 1 hour continuously connected to a BVP-330A camera, with a fully charged BP-90 battery
Interchangeability	Fully interchangeable with all conventional U-matic recorders/players
Usable tape	KCS and KSP-S type tape

Special functions

Simultaneous playback picture and tape remaining time indication	Possible with a camera having the return video function.
Pause	Possible
Search	Possible (about 10 times normal speed in forward and reverse directions)
Edit	Audio dubbing
Tracking control	Possible
Remote control	Record, playback, fast forward, rewind, pause and stop, with an optional RM-680 remote control unit

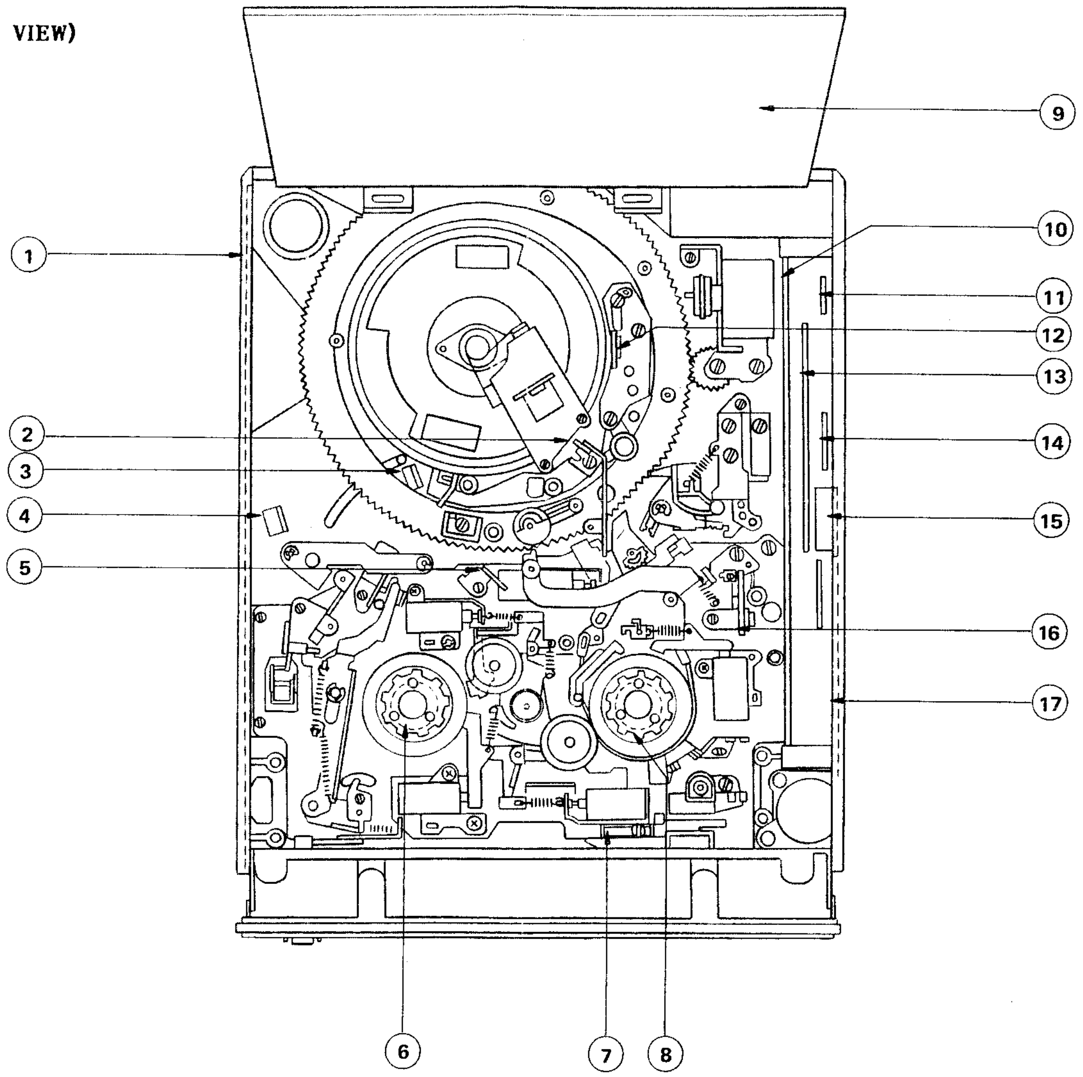
Time code

Input	
TIME CODE IN	0.5 to 5 Vp-p, 10k ohms, unbalanced
Output	
TIME CODE OUT	0 dB ± 3 dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)
SC IN	2 V(p-p) ±1 V, 75 ohms, unbalanced
RF (OFF TAPE)	0.5 V(p-p) ±0.1 V, 75 ohms, unbalanced

2-2. MAIN PARTS LOCATION

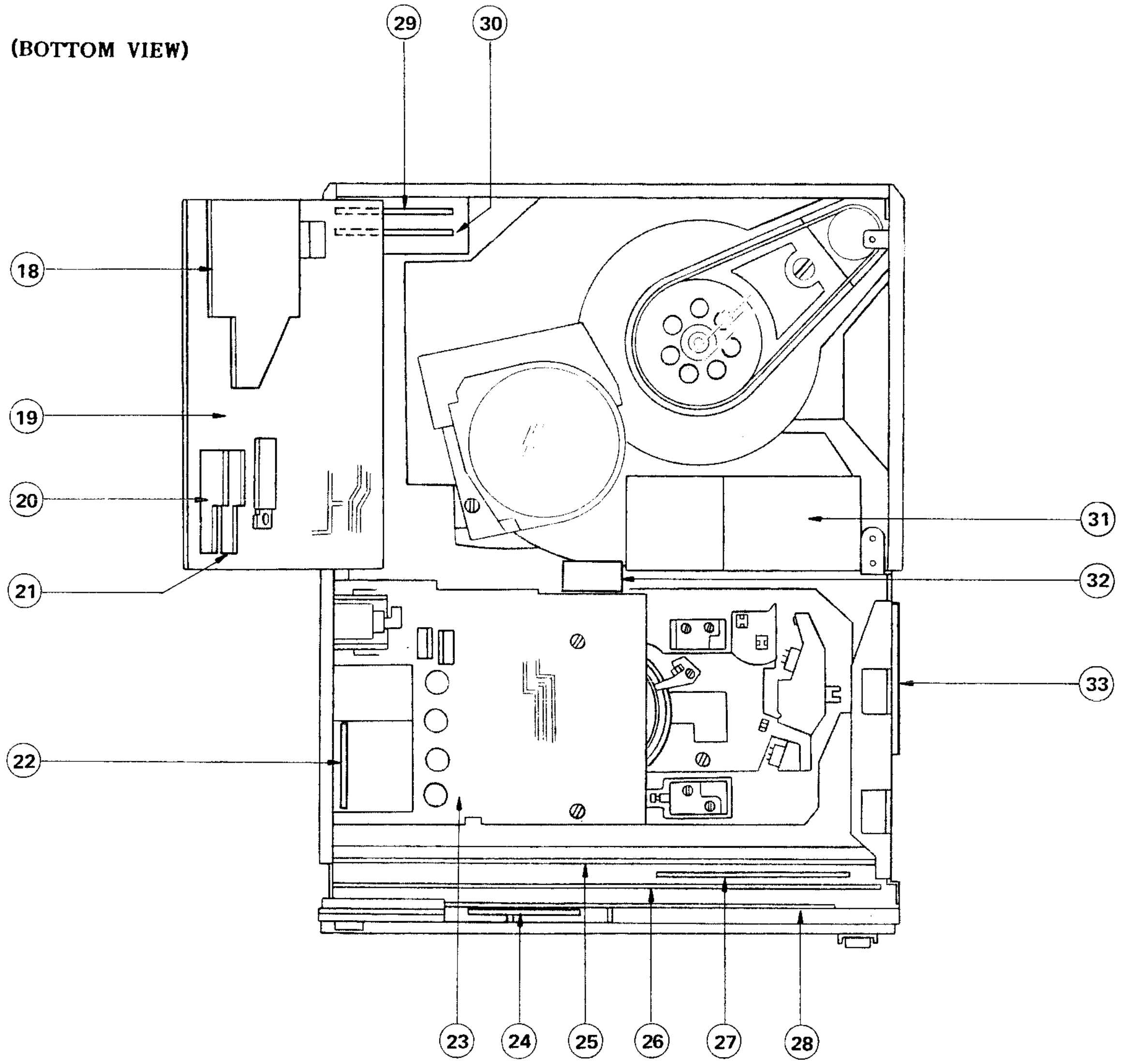
2-2-1. Location of the Printed Circuit Board

(TOP VIEW)



① SV-57C Board
② DUS-5 Board
③ DUS-5 Board
④ LE-20 Board
⑤ LE-21 Board
⑥ PC-22 Board
⑦ TM-19 Board
⑧ PC-22 Board
⑨ YC-20 Board
⑩ AU-49A Board (with DUS-69 Board)
⑪ DUS-69 Board
⑫ DU-58 Board
⑬ CM-19A Board
⑭ DUS-70 Board
⑮ DUS-6 Board
⑯ DUS-4 Board
⑰ AU-51A Board (with DUS-3 Board)

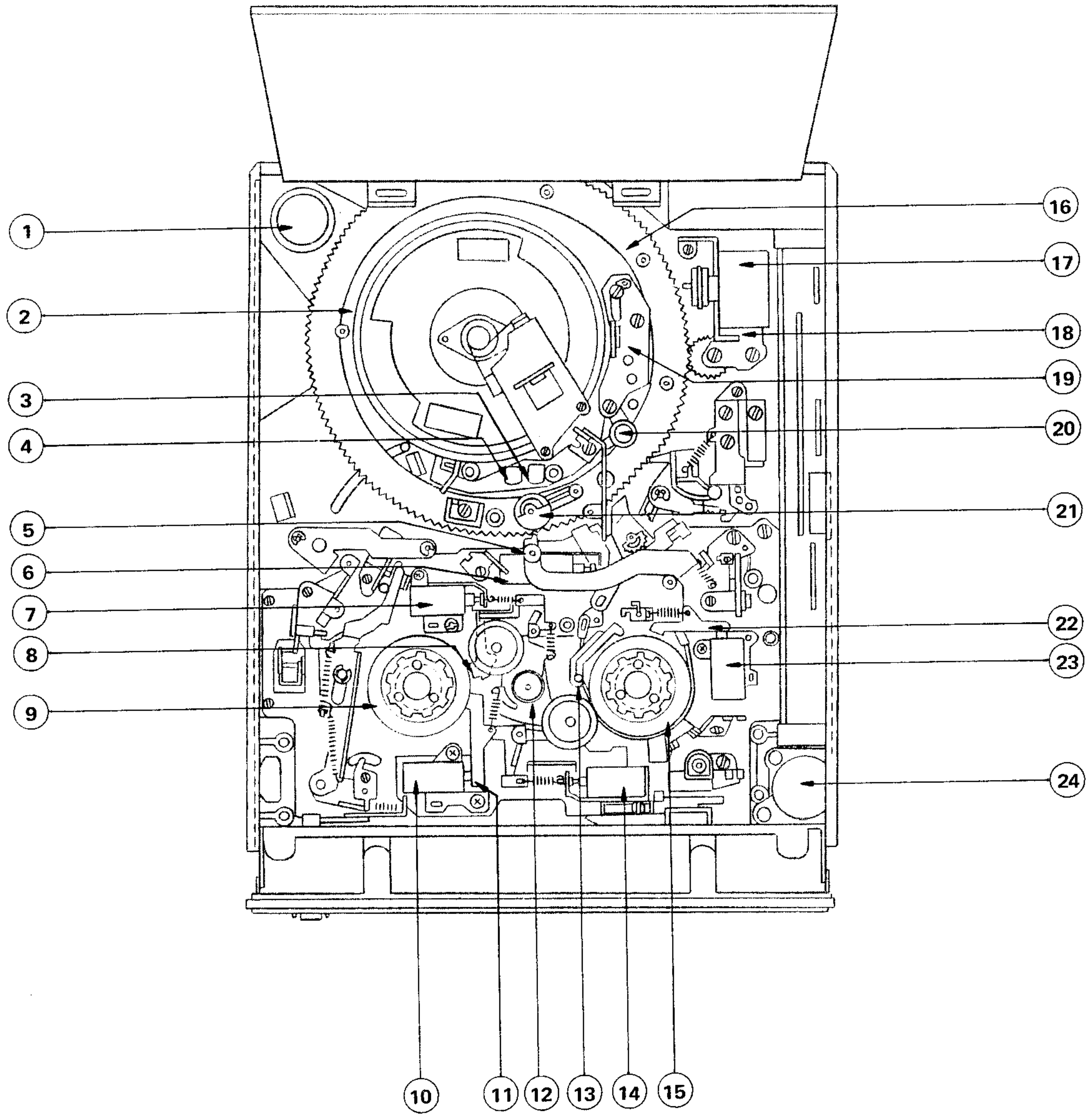
(BOTTOM VIEW)



⑱ CR-26 Board
⑲ VO-12 Board
⑳ BF-12 Board
㉑ VA-29 Board
㉒ PA-48 Board
㉓ PSB-4 Board
㉔ SWB-4 Board
㉕ SY-22A Board
㉖ SY-18C Board (with DUS-33 Board)
㉗ SY-23 Board
㉘ KY-86 Board
㉙ AU-64 Board (with DUS-94 Board)
㉚ AU-65 Board (with DUS-94 Board)
㉛ RP-24 Board
㉜ CN-100 Board
㉝ CN-26 Board

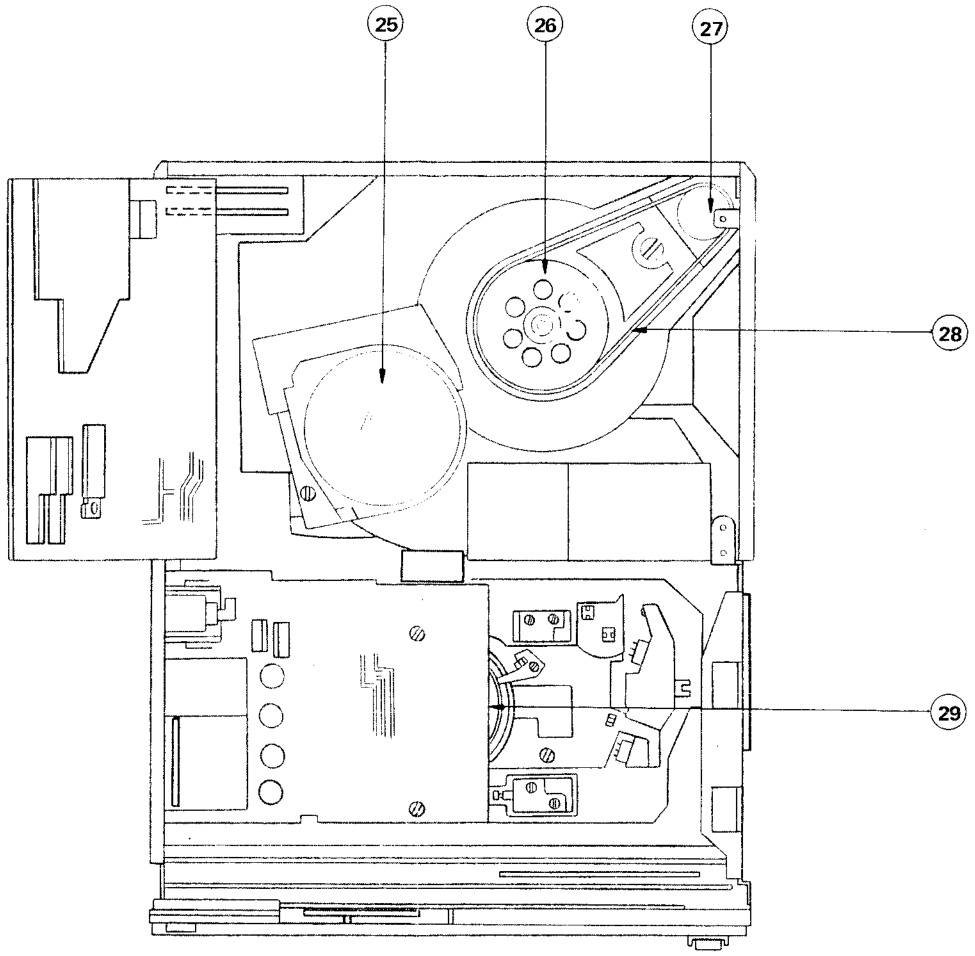
2-2-2. Location of the Mechanical Main Parts/Components

(TOP VIEW)



① Drum Motor
② Drum
③ Full Erase Head
④ Time Code Head
⑤ Tension Regulator
⑥ Tension Regulator Solenoid
⑦ Take-up Idler Solenoid
⑧ Take-up Soft Brake
⑨ Take-up Reel Table
⑩ Take-up Brake Solenoid
⑪ Take-up Main Brake
⑫ Midway Pulley
⑬ Supply Soft Brake
⑭ Supply Idler Solenoid
⑮ Supply Reel Table
⑯ Threading Ring
⑰ Threading Motor
⑱ Threading Gear Box
⑲ Audio/CTL Head
⑳ Capstan
㉑ Pinch Roller
㉒ Supply Main Brake
㉓ Supply Brake Solenoid
㉔ Reel Motor

(BOTTOM VIEW)



㉕ Capstan Motor
㉖ Drum Pulley
㉗ D Motor Pulley
㉘ Drum Belt
㉙ Relay Pulley

2-3. PRINTED CIRCUIT BOARD

The circuit information is provided below.

SYSTEM	BOARD	CIRCUIT FUNCTION
VIDEO	VO-12	Y MOD/Demodulator
	IF-99	RF Check board
	BF-12	View Finder
	YC-20	Y/C Separator
	CR-26	Chroma ACC/APC/FREQ Conv.
	VA-29	Y/C Mix, Video Output
	RP-24	Video REC/PB Amplifier
AUDIO	AU-49A	Audio REC/PB Amplifier
	DUS-69	
	DUS-6	Tracking VR
	AU-64	Audio CH-1 Dolby
	AU-65	Audio CH-2 Dolby
	DUS-94	VAR, Inductor
	DU-58	Audio R/P/Erase, CTL Head
	AU-51A	BIAS/Erase OSC, REC/PB Control
	DUS-3	VAR,Inductor
	CM-19A	Camera/MIC Input Select
	DUS-70	Camera Input
	SWB-4	Audio Level/Meter Select
SERVO	SV-57C	Drum/Capstan/Reel Servo
	PC-22	S/T-Reel FG Gen.
POWER	PSB-4	Power Supply/Time Code REC Amplifier
	TM-19	Hours Meter
	CN-26	DC In Connector
	CN-100	Backup Capacitor
KEY	KY-86	Function Key/Display
	PA-48	Time Code PB Amplifier
SYSTEM CONT-ROL	SY-18C	System Control
	DUS-33	VAR, Inductor
	DUS-5	Solar Battery
	LE-20	LED For Tape Begin/End DET
	LE-21	LED For Tape Begin/End DET
	SY-22A	System Control
	DUS-4	Tenreg SW
	SY-23	Solenoid Driver

2-4. CONNECTION CONNECTOR

When external cables are connected to the various connectors on the connector panel during the maintenance, hardware (as stated below) or equivalents must be used.

Panel Indication	Connection Connector
VIDEO IN VIDEO OUT	1-560-069-11 PLUG, BNC, male
AUDIO IN	1-508-084-00 CONNECOTOR, XLR, 3P, female
AUDIO OUT	1-508-083-00 CONNECTOR, XLR, 3P, male
CAMERA	1-508-929-00 PLUG, 14P, male
DC IN 12V	1-508-362-00 CONNECTOR, XLR, 4P, female

2-5. INPUT/OUTPUT SIGNAL OF THE CONNECTOR

INPUT

VIDEO IN : 1 Vp-p ± 0.3 V, composite, sync negative, 75 ohms, unbalanced

AUDIO IN

CAMERA MIC IN: -20 dB/-60 dB switchable, more than 3k ohms impedance, balanced

CH-1/L/DUB, CH-2/R

LINE : +4 dB, more than 10k ohms impedance, balanced

MIC : -60 dB, more than 3k ohms impedance, balanced

TIME CODE IN : 0.5 to 5 Vp-p, 10k ohms, unbalanced

SC IN : 2 Vp-p ± 1 V, 75 ohms, unbalanced

OUTPUT

VIDEO OUT : 1 Vp-p ±0.2 V, composite, sync negative, 75 ohms, unbalanced

AUDIO OUT

MONI (CH-1/L), CH-2/R : +4 dB (at 600 ohms load) balanced

EARPHONE : -33 to -20 dB (at 8 ohms load), adjustable

TIME CODE OUT : 0 dB ± 3 dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)

RF (OFF TAPE) : 0.5 Vp-p ±0.1 V, 75 ohms, unbalanced

2-6. SELECT SWITCH SETTING

VO-12 Board

S201 : CONVENTIONAL MODE and AUTO DETECT MODE Select Switch

ON : CONVENTIONAL MODE only

OFF: AUTO DETECT MODE of KSP-S CASSETTE TAPE

When the set is shipped, the CONVENTIONAL MODE and AUTO DETECT MODE Select Switch is set to the OFF position.

YC-20 Board

S201 : CHROMA PROCESSOR Switch

When the chroma level of the fine pitch vertical strip portion decreases under the composite dubbing mode, this switch is set to the ON. Then, chroma level keeps to the correct level, but the cross color is more remarkable than this switch is set to the OFF mode.

When the set is shipped, the CHROMA PROCESSOR Switch is set to the OFF position.

SY-22 Board

S1 : SELF DIAGNOSTICS Switch

ON : SELF DIAGNOSTICS mode

OFF: CTL or Time Code Display

When the set is shipped, the SELF DIAGNOSTICS Switch is set to the OFF position.

(NOTE)

ON/OFF position of this switch as follows:

. Left side is ON.

. Right side is OFF.

2-7. SUPPLIED ACCESSORY

Supplied BVU-150P accessories are as follows.

1. Shoulder strap
2. Carrying strap
3. Carrying handle
4. Soft carrying case
5. LEVEL control knob

2-8. OPTIONAL ACCESSORY

The followings are provided as the optional accessory.

1. AC-500CE ac power adaptor
2. BC-210CE battery charger
3. RM-680 remote control unit
4. BP-90 rechargeable battery
5. KCS and KSP-S series video cassette
6. KCS-1C cleaning cassette

SECTION 3
PERIODIC CHECK AND MAINTENANCE

It is recommended that the following periodic check and maintenance schedule be employed in order to obtain maximum performance and longer tape life from BVU-150P.

3-1. MAINTENANCE AFTER REPAIRS

Perform the following maintenance after repair regardless the operating hours of the machine.

(1) Cleaning of the video heads and confidence heads

. Press the cleaning piece moistened with the cleaning fluid and turn the drum slowly with hand, cleaning the heads.
(Never turn the motor by the electric power for the cleaning.)

. Never move the cleaning piece in the vertical direction of head tip in the cleaning. It tends to damage the video head tips.

(2) Cleaning of tape running system

. Wipe the tape bearing surfaces (of the tape guide, drum, capstan, and pinch roller) with cleaning piece saturated with the cleaning fluid.

(3) Cleaning of drive system

. Wipe the drive system (such as belt, idler, and reel table surface) with cleaning piece saturated with the cleaning fluid.

3-2. PERIODIC CHECK

Perform the maintenance checks described separately in accordance with the operational hours of the machine.

3-3. HOURS METER

BVU-150P has an hours meter on the chassis for the periodic check and maintenance. It is recommended that the hours meter is used as a tool for determining the periodic check. When the hours meter indicates the maximum value, 1000 hours, the hours meter must be replaced with a new one.

3-4. OTHERS

(1) Sony oil

. Be sure to use the Sony oil as the lubrication oil. (If oil other than the Sony oil is used, various troubles due to different viscosity tends to be caused.)
Sony oil: Part No. 7-661-018-01

. Use the Sony oil in which dust or other foreign material have not mixed for lubricating the bearing. (If foreign material is in the oil, wear or burning of the bearing tends to be caused.)

○: Cleaning ◆: Replace ◎: Apply a oil ◇: Check

Operating hours(H) Item	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape path cleaning	○	○	○	○	○	○	○	○	○	○	Perform whenever repair work is attempted.
Video and confidence heads cleaning and/or replacing	○	◆	○	◆	○	◆	○	◆	○	◆	Life of the video heads are affected extensively by operating ambient condition.
Belt and idler cleaning and/or replacing	–	○	–	◆	–	○	–	◆	–	○	
Pinch roller cleaning and/or replacing	○	○	○	○	○	◆	○	○	○	○	
Reel table surface cleaning	–	○	–	○	–	○	–	○	–	○	
Apply a oil to the reel shaft and thrust bearing	–	◎	–	◎	–	◎	–	◎	–	◎	
Check the T soft brake torque and/or T soft brake replacing	–	–	–	◇	–	–	–	◇	–	–	
Check the S soft brake torque and/or S soft brake replacing	–	◇	–	◇	–	◇	–	◇	–	◇	
Check the T brake torque and/or T main brake replacing	–	◇	–	◇	–	◇	–	◇	–	◇	
Check the S brake torque and/or S main brake replacing	–	◇	–	◇	–	◇	–	◇	–	◇	
Tracking check	–	◇	–	◇	–	◇	–	◇	–	◇	

SECTION 4
SERVICE INFORMATION

4-1. REMOVAL OF CABINET

. upper case

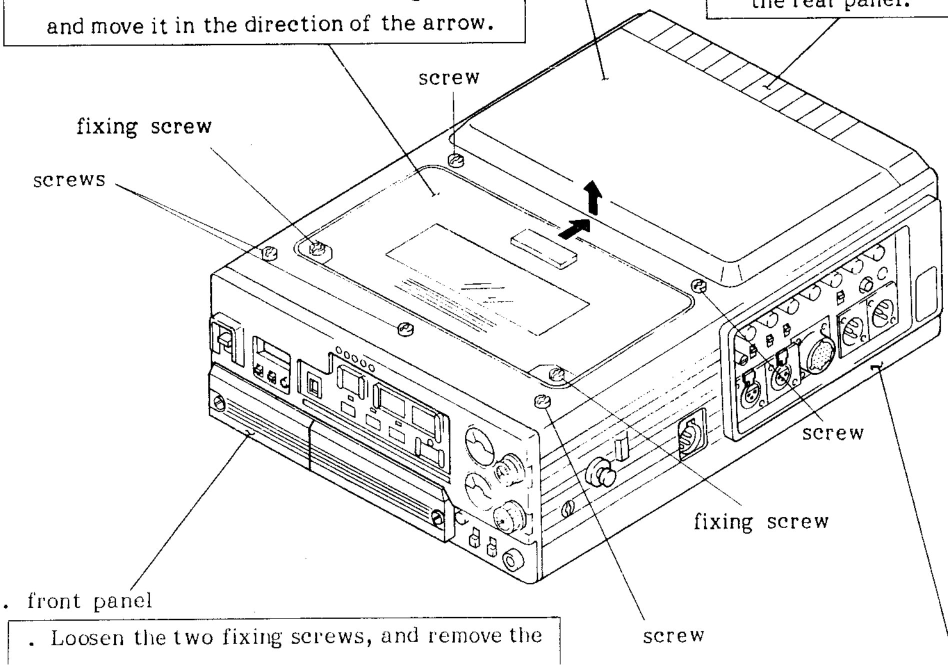
- . Remove the rear panel.
- . Loosen the five fixing screws, and remove the upper case.

. Cassette-up Compartment Upper Lid

- . Remove the upper case.
- . Put the Cassette-up Compartment into the raised state. Loosen the two fixing screws and move it in the direction of the arrow.

. rear panel

- . Loosen the four fixing screws, and remove the rear panel.



. front panel

- . Loosen the two fixing screws, and remove the BKU-150P.
- . Loosen the four fixing screws, and remove the front panel.

. lower case

- . Remove the rear panel.
- . Loosen the four fixing screws, (two are on the sides, and the other two are on the bottom of the unit.)
- . Disconnect Connector CN703/PSI-4 Board.

4-2. SPARE PARTS

(1) The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

(2) Replacement parts supplied from the Sony Parts Center will sometimes have a different shape from the original parts. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".
This manual's exploded views and electrical spare parts list indicate the part numbers of "the standardized genuine parts at the present". Regarding engineering part changes in our engineering department, refer to Sony service bulletins and service manual supplements.

(3) The parts marked with "s" in the SP column of the exploded views and electrical spare parts list are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

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9. POWER SUPPLY AND SYSTEM CONTROL ALIGNMENT

(This section will be available at a later date.)

10. SERVO SYSTEM ALIGNMENT

(This section will be available at a later date.)

11. AUDIO SYSTEM ALIGNMENT

(This section will be available at a later date.)

12. VIDEO SYSTEM ALIGNMENT

(This section will be available at a later date.)

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4-3. CASSETTE-UP COMPARTMENT REMOVAL PROCEDURES

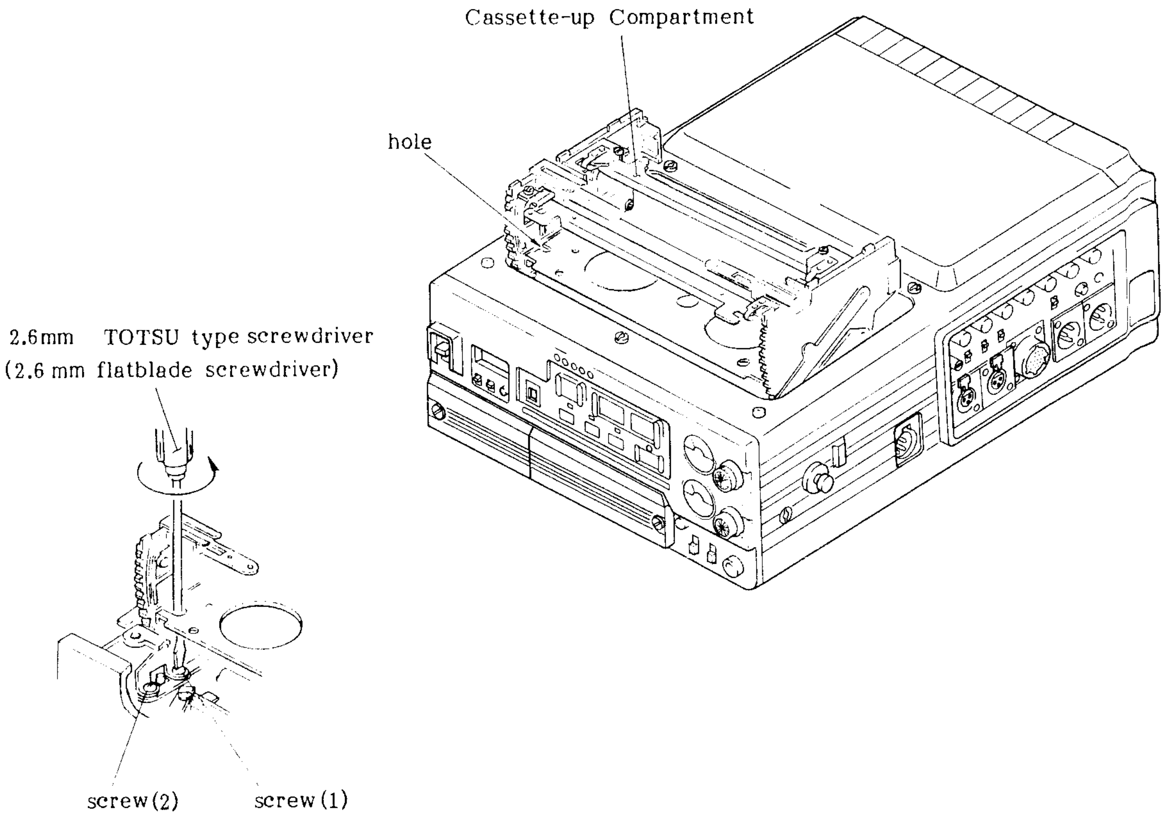
(1) Put the Cassette-up Compartment into the raised state.

(2) Remove the Cassette-up Compartment Upper Lid.

(3) Insert a 2.6mm TOTSU ⊖ screwdriver (or a 2.6mm flatblade screwdriver) into the left hole of the Cassette-up Compartment, as shown in the figure, and loosen the fixing screw (1) as shown in the detailed view. The fixing screws can not be detached since they uses retainers on the Cassette-up Compartment.

(4) Loosen the fixing screw (2), as shown in the detailed view.

(5) Loosen the right fixing screws in the same manner. The Cassette-up Compartment can now be removed from the chassis.



4-4. NOTES WHEN SERVICING

4-4-1. When lifting the VTR with the Cabinet Removed

Since this VTR is designed as a portable VTR, and the frame is composed of aluminum for lightweight. When the set is lifted with the cabinet removed, do not press forcibly against the frame. If you do so, there is a danger that the frame will be bent.

4-4-2. Maintenance of the Printed Circuit Board in the Rotary Upper Drum

The Playback Pre-amplifier for the video signal, the PA-45 Board, is installed on the Rotary Upper Drum.
The dynamic balance of the entire Rotary Upper Drum is perfectly adjusted in this state.
Therefore, the PA-45 Board should not be removed from the Rotary Upper Drum nor should the electric parts on the printed board be installed or removed. (Never perform solder to remove or install.)
When the PA-45 Board fails, replace the entire Rotary Upper Drum. If the PA-45 Board is removed, the dynamic balance will be out of specification. Jitter will be increase, and the servo will be unstable.

4-5. MUTING OF THE TAPE BEGINNING SENSOR AND THE TAPE END SENSOR

Short between TP-6/SY-22A Board and GND (frame) with a short clip lead. The Tape Beginning Sensor and the Tape End Sensor stop their operation.

4-6. HOW TO OPERATE THE VTR WITHOUT INSERTING A CASSETTE TAPE

Perform Sec. 4-5, Muting of the Tape Beginning Sensor and the Tape End Sensor, before operating the following modes.

4-6-1. Threading

(1) Turn the POWER ON.
(2) Push down on the Cassette-in Switch with finger. (The threading operation starts.)
(3) Remove the finger from the Cassette-in Switch after the rotation of the Threading Ring has fully stopped. (The VTR is put into the Threading-end mode.)

4-6-2. Unthreading (EJECT)

(1) Depress the EJECT botton until it locks.
(2) Push down on the Cassette-in Switch with a finger. (The unthreading operation starts.)
(3) When the Threading Ring has stopped its rotation, the Cassette-up Compartment rises automatically.

4-6-3. PLAY

(1) Put the machine into the Threading-end state.
(2) Push the PLAY button.

4-6-4. F.FWD

(1) Put the machine into the Threading-end state.
(2) Press the F.FWD button.

4-6-5. REW

(1) Put the machine into the Threading-end state.
(2) Press the REW button.

4-6-6. REC

(1) Connect the video signal or a camera to the machine.
(2) Put the machine into the Threading-end state.
(3) Push the REC and PLAY buttons simultaneously.

4-6-7. STOP

(1) Push the STOP button. (The cassette tape stops and remains in the Threading state.)

4-7. TAPE PROTECTION

The VTR has various detection circuits for tape protection. These detection circuits are described here for each modes.

(1) During threading

When the drum rotation stops for more than 2 seconds during the Threading mode, the DRUM ROTATE signal is not present. The protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the threading operation stops.

(2) During F.FWD

When the VTR is put into the following states during the F.FWD mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the F.FWD operation stops.

. When the take-up reel table rotation stops for more than 3.6 seconds and generates the REEL STOP signal.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATE signal.

(3) During REW

When the VTR is put into the following states during the REW mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the REW operation stops.

. When the supply reel table rotation stops for more than 3.6 seconds and generates the REEL STOP signal.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATION signal.

(4) During PLAY

When the VTR is put into the following states during the PLAY mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the PLAY operation stops.

. When the take-up reel rotation stops for more that 1.2 seconds and generates the REEL STOP signal.

. When the drum rotation stops for more than 2 seconds and does not generate tha DRUM ROTATION signal.

When put into the following states, the protection circuit detects tape slack if it occurs and releases the pressure of the pinch roller against the capstan shaft.

. When the capstan motor rotates in the reverse direction (against the designated direction) for more than 2 seconds with the pinch roller pressed against the capstan shaft.

(For example, the capstan motor should rotate in the FWD direction in the PLAY mode. However, when it rotates in the REV direction, the tape protection circuit detects this.)

(5) During STOP in the STANDBY ON mode

When the VTR is put into the following state during STOP in the STANDBY ON mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATE signal.

(6) During STOP in the STANDBY OFF mode

When the VTR is put into the following states during STOP in the STANDBY OFF mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights.

. When the capstan shaft rotates in the REV direction to release the tape tension with the pinch roller pressed against the capstan shaft, if the capstan shaft does not stop its rotation in 2 seconds, the pinch roller pressure against the capstan shaft is released.

. When the tension arm does not return to the designated position in 700 msec. during the tape tension releasing operation.

(7) During FWD PAUSE

When the VTR is put into the following state during the FWD PAUSE mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the FWD/PAUSE operation stops.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATE signal.

(8) During REC PAUSE

When the VTR is put into the following states during the REC PAUSE mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the REC PAUSE operation stops.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATE signal.

. When the capstan shaft rotates in the REV direction to release the tape tension with the pinch roller pressed against the capstan shaft, if the capstan shaft does not stop its rotation in 2 seconds, the pinch roller pressure against the capstan shaft is released.

(9) During SHORT REW

When the VTR is put into the following states during the SHORT REW mode, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the SHORT REW operation stops.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATE signal.

. When the supply reel table rotation stops for more than 3.6 seconds and generates the REEL STOP signal.

(10) Druing BRAKE MODE

When the operation of (such as PLAY, F.FWD and REW) modes changes to the STOP mode, the reel table stops its rotation during this mode changing. This mode is called the BRAKE MODE. When the VTR is put into the following states during the BRAKE MODE, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights.

. When the Take-up Reel Table stops for more than 2 seconds and generates the REEL STOP signal during the mode change from the PLAY or F.FWD mode to the STOP mode.

. When the Supply Reel Table stops for more than 2 seconds and generates the REEL STOP signal during the mode change from the REW mode to the STOP mode.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATE signal.

(11) During unthreading (take-up of the tape by the Take-up Reel Table)

This Unthreading mode shows the following unthreading operations,

When the condensation sensor on the lower drum detects condensation or when the drum does not rotate.

When the VTR is put into the following state during this operation, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the unthreading operation stops.

. When the Take-up Reel Table rotation stops for more than 2 seconds and generates the REEL STOP signal.

(12) During unthreading (take-up of the tape by the Supply Reel Table)

This Unthreading mode shows the normal unthreading operation. When the VTR is put into the following states during this operation, the protection circuit detects tape slack if it occurs. The SLACK LAMP lights, and the unthreading operation stops.

. When the Supply Reel Table rotation stops for more than 2 seconds and generates the REEL STOP signal.

. When the drum rotation stops for more than 2 seconds and does not generate the DRUM ROTATE signal.

4-8. CASSETTE REMOVAL PROCEDURE WHEN NORMAL EJECTION IS NOT POSSIBLE

If the eject operation becomes impossible due to tape slack when the eject operation is attempted, cassette tape can be removed from the machine by the following procedures.

(1) Remove the rear panel.

(2) Remove the upper case.

(3) Remove the upper lid of Cassete-up Compartment.

(4) Push down on the EJECT key until it locks.

(5) Turn the pulley of Threading Motor by hand so that the Threading Ring rotates into the unthreading mode. When the unthreading mode is completed, the lock of the Cassette-up Compartment is released and rises automatically. At this time, hold down the Cassette-up Compartment by hand so that it does not rise when the unthreading mode is completed and the tape is not damaged.

(6) While holding the cassette tape lid so that it does not close, rise the Cassette-up Compartment slowly.

(7) Remove the tape remaining in the machine carefully so that the tape is not damaged.

4-9. FIXTURE FOR ALIGNMENT

Parts No.	Description
J-6001-820-A	Drum Eccentricity Gauge (3)
J-6001-830-A	Drum Eccentricity Gauge (2)
J-6001-840-A	Drum Eccentricity Gauge (1)
J-6001-930-A	Drum Eccentricity Gauge (4)
J-6002-270-A	Reel Table Torque Measurement Tape (40mm dia.)
J-6009-830-A	Flatness Plate
J-6080-013-A	Dihedral Adjusting Screw
J-6080-029-A	Small Mirror for Adjustment
J-6080-030-1	Spare Mirror
J-6130-010-A	Reel Table Height Check Base Jig
J-6130-020-A	Reel Table Height Check Jig
J-6152-450-A	Clearance Check Gauge
J-6152-560-A	Tape Guide Slantness Check Tool
Y-2031-001-0	Cleaning Fluid
2-034-697-00	Cleaning Piece
3-702-390-01	Eccentric Screwdriver (4mm dia.)
7-732-050-20	Tension Scale (50g full scale)
7-732-050-30	Tension Scale (100g full scale)
7-732-050-50	Tension Scale (500g full scale)
8-960-036-02	Alignment Tape, RR2-1SD PAL
8-960-036-80	Alignment Tape, RR5-1SD PAL
9-911-053-00	Thickness Gauge

SECTION 5
REPLACEMENT OF MAJOR PARTS

5-1. REPLACEMENT OF THE ROTARY UPPER DRUM

. The Rotary Video Heads and Confidence Heads cannot be replaced individually. The entire Rotary Upper Drum Assembly must be replaced when any one of these heads fail.

. The Playback Pre-amplifier Board for the video signal, the PA-45 Board, is mounted on the Rotary Upper Drum, and the dynamic balance of the entire Rotary Upper Drum is perfectly adjusted in this condition. Therefore, the PA-45 Board should not be removed from the Rotary Upper Drum. When the PA-45 Board fails, replace the entire Rotary Upper Drum Assembly.

Tool: Drum eccentricity gauge (1)
Drum eccentricity gauge (2)
Drum eccentricity gauge (3)
Drum eccentricity gauge (4)
Reel table height adjustment base jig

Replacement procedure:

(1) Remove the fixing screws of the stay.

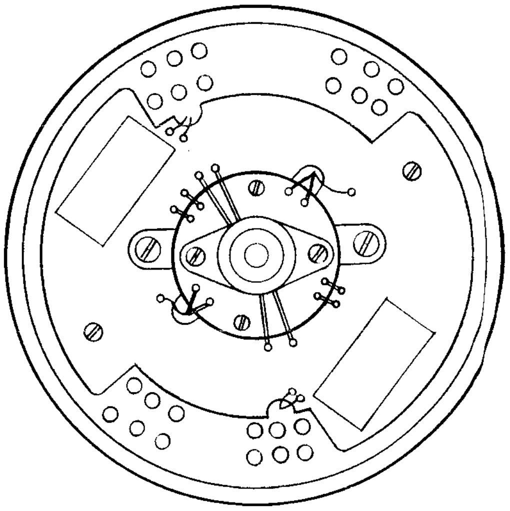
(2) Remove the brush of the Slip-ring Block.

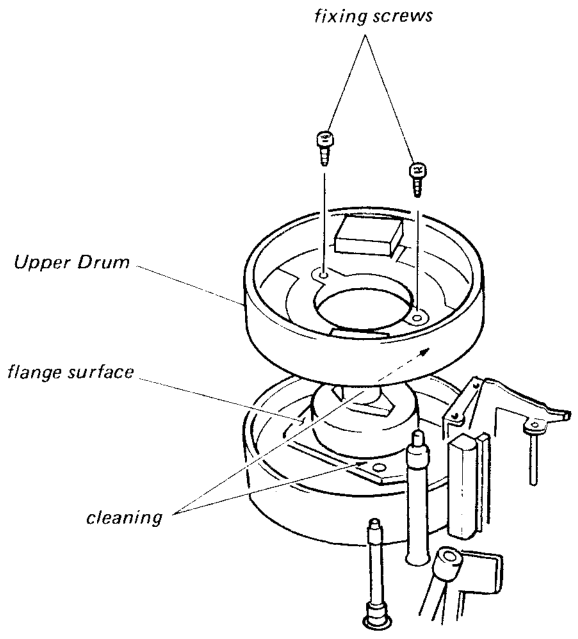
(3) Unsolder the twelve leads from the round printed circuit board at the center of the drum.

(4) Loosen the fixing screws of the Rotary Upper Drum, and remove the Rotary Upper Drum from the Head Drum Assembly.

(5) Clean the matching surfaces of the flange and the new Rotary Upper Drum with a cloth moistened with a cleaning fluid. (If there is a spacer between drum and flange, it should be left in place, or a spacer of the same thickness should be re-installed.)

(6) Place the Rotary Upper Drum so that the silk screened "CH-A" on the PA Board is close to the "A" side of the round printed circuit board. Thread the two screws snugly but not tight.





Adjustment procedure:

(1) Place the reel table height adjustment base jig in the cassette's position.

(2) Assemble the drum eccentricity gauges (1), (2), (3) and (4), as shown in the figure. Mount the assembled gauges on the reel table height adjustment base jig. Adjust the position of the gauge so that the tip probe are at a point about 5mm from the top edge of the Rotary Upper Drum.

(3) Turn the Rotary Upper Drum slowly clockwise and check that the pointer deflection of the gauge is within 5 micron during one complete turn of the Rotary Upper Drum. If this specification is satisfied, proceed with Step (5). If it is not, perform Step (4).

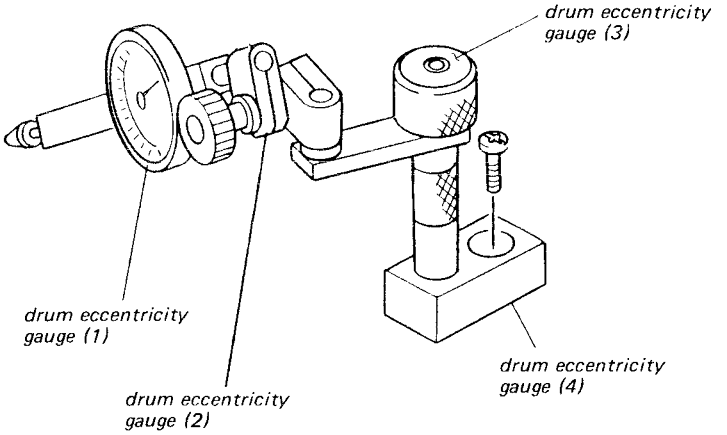
(4) Tap the Rotary Upper Drum with a nylon hammer or a screwdriver handle so that the gauge deflection remains within 5 micron.

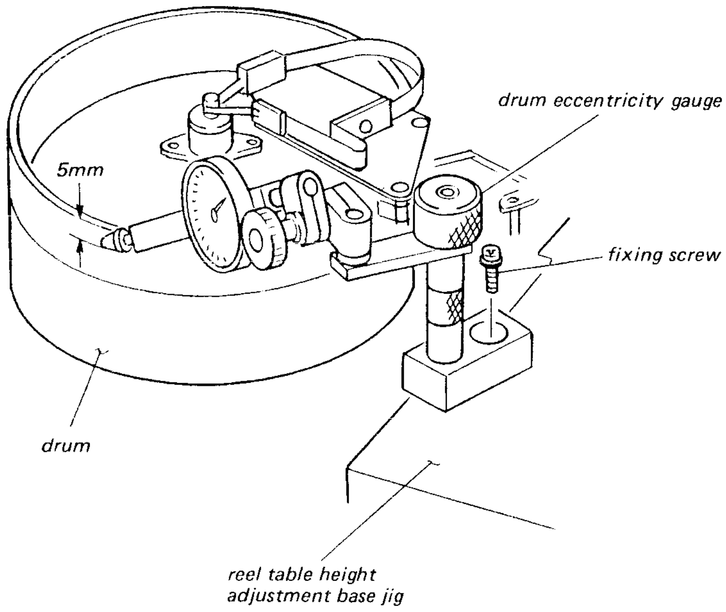
(5) After adjustment, tighten the two screws that secure the Rotary Upper Drum, alternately and gradually using a tightening torque of 8kg.cm.

(6) After the screws are tightened, check again that the eccentricity of the Rotary Upper Drum is within 5 micron.

(7) Solder the leads.

(8) Mount the brush and stay.


drum eccentricity gauge (3)
drum eccentricity gauge (1)
drum eccentricity gauge (4)
drum eccentricity gauge (2)



5-2. REPLACEMENT OF THE TENSION REGULATOR

Replacement procedure:

(1) Disconnect Connector CN288 of the SY-22A Board.

(2) Remove the Supply Reel Table.

(3) Remove the spring from between the TR Drawer Arm (B) and the Spring Holder of the Tension Regulator Block.

(4) Remove the TR Band from the Tension Regulator.

(5) Remove the spring of the Tension Regulator Sub Arm.

(6) Remove the lock screw and the fixing screw, and remove the Tension Regulator Block.

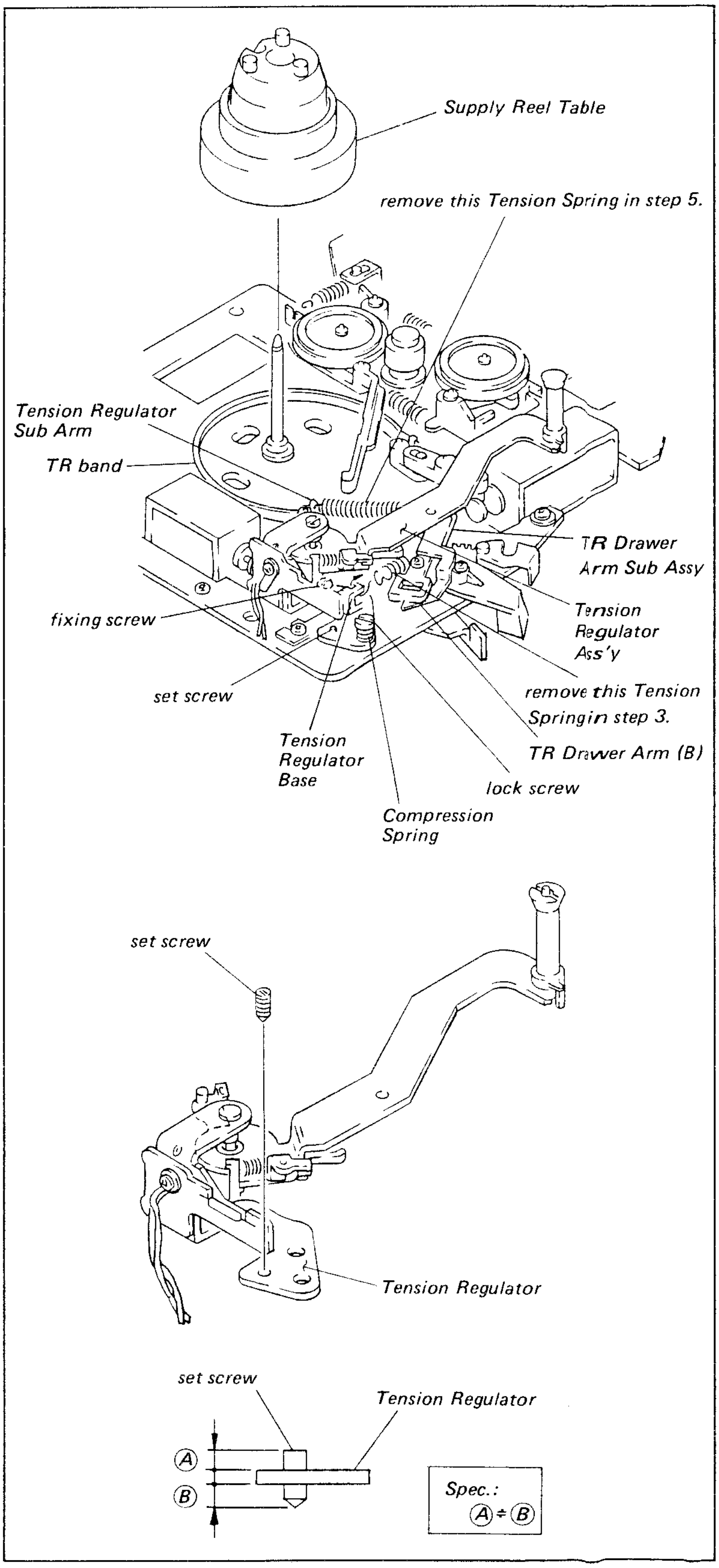
(7) Check that the position of the set screw of new Tension Regulator Block meets the required specification, as shown in the figure.

(8) Install the new Tension Regulator on the chassis with the fixing screw, compression spring and lock screw. At this time, note the following points:

  (i) Install the Tension Regulator base so that it is parallel to the chassis.

  (ii) Turn the lock screw back 180 degrees from the position at which it is tight.

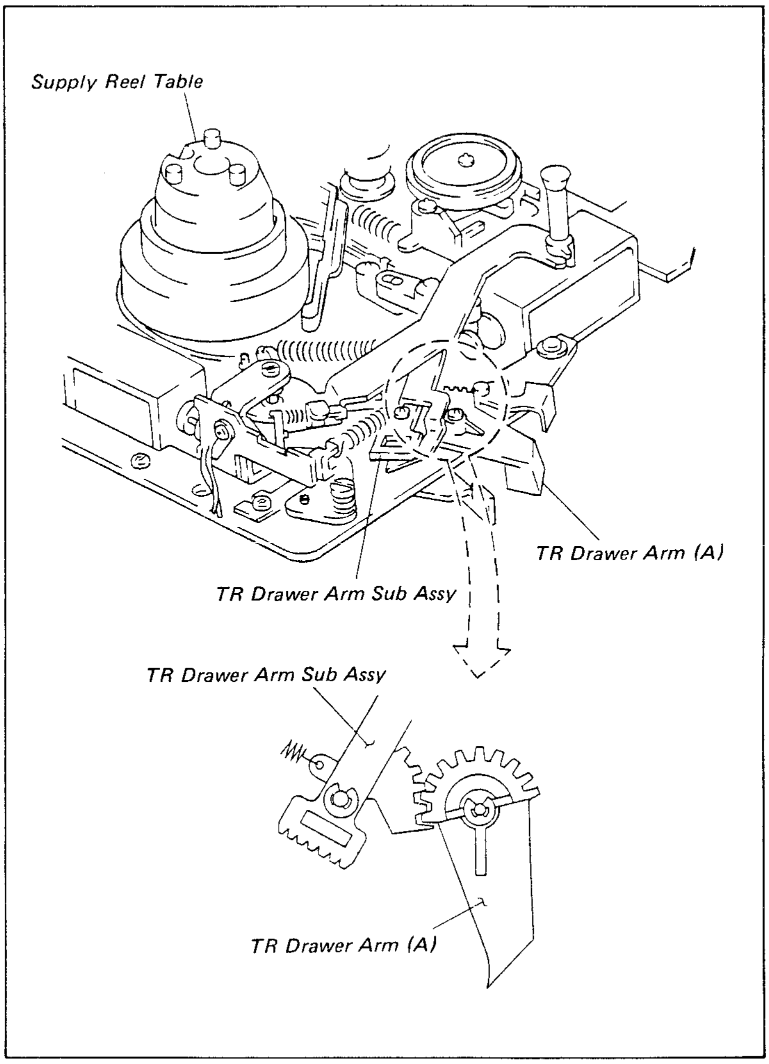
(9) Perform Steps (1) to (6) in reverse order.



5-3. REPLACEMENT OF TR DRAWER ARM (A) OR SUB ASSY

Replacement procedure:

- When replacing the TR Drawer Arm (A) or Sub Assy, assemble TR Drawer Arm (A) and Sub Assy to meet the positional relationship, as shown in the figure.



5-4. REPLACEMENT OF TR BRAKE BAND

Replacement procedure:

(1) Remove the Supply Reel Table.

(2) Remove the TR Band Hook from the Tension Regulator.

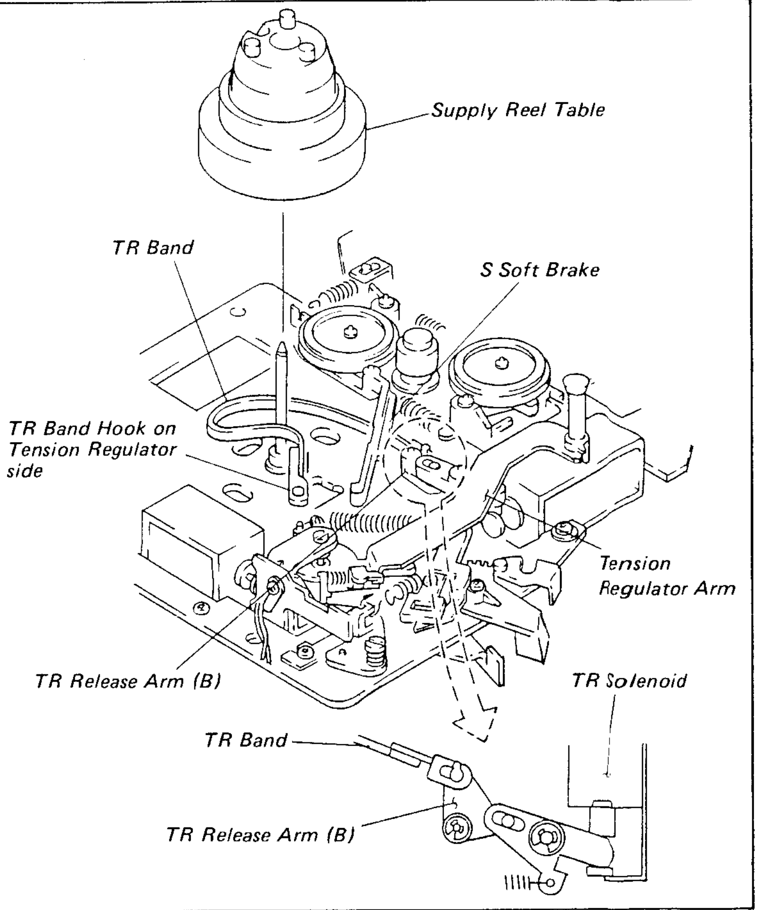
(3) Remove the TR Band Hook from the TR Release Arm (B).

(4) Fasten the TR Band Hook of the new TR Brake Band on the TR Release Arm (B) without damaging the TR Brake Band.

(5) Pass it under the S Soft Brake without damaging the TR Brake Band.

(6) Fasten the TR Band Hook on the Tension Regulator.

(7) Install the Supply Reel Table.



5-5. REPLACEMENT OF RELAY PULLEY

Tool: Allen wrench (across flat has 1.27mm)

Replacement procedure:

(1) Loosen the set screw of the Midway Pulley and remove the Relay Pulley.

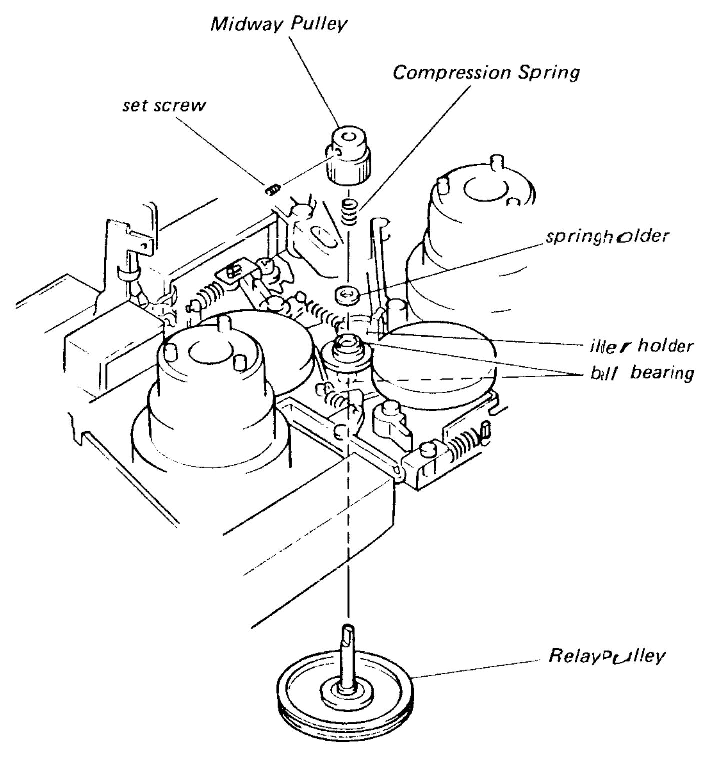
(2) Check that the two ball bearings are installed in the Idler Holder.

(3) Insert the Relay Pulley.

(4) Insert the Spring Holder, Compression Spring and Midway Pulley, in order.

(5) Insert the set screw of the Midway Pulley into the D cut portion of the pulley shaft.

(6) Aligne the ends of the Midway Pulley and the pulley shaft, and tighten the set screw.



5-6. REPLACEMENT OF THREADING MOTOR

Replacement procedure:

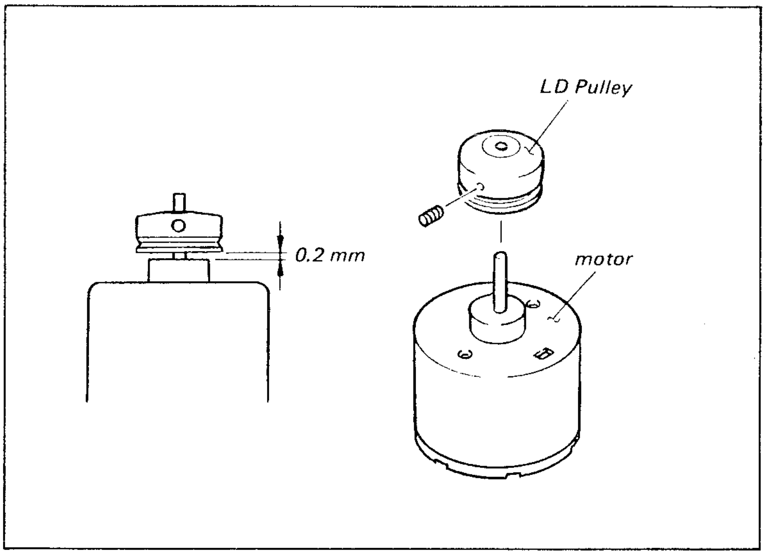
(1) Disconnect connector CN207/SY-22A Board.

(2) Remove the gear box block from the unit.

(3) Remove the LD Pulley from the defective threading motor.

(4) Replace the new motor.

(5) Install the LD Pulley. Adjust the position of the LD Pulley so that the clearance between the LD Pulley and the motor meets the required specification.



5-7. REPLACEMENT OF REEL MOTOR

Replacement procedure:

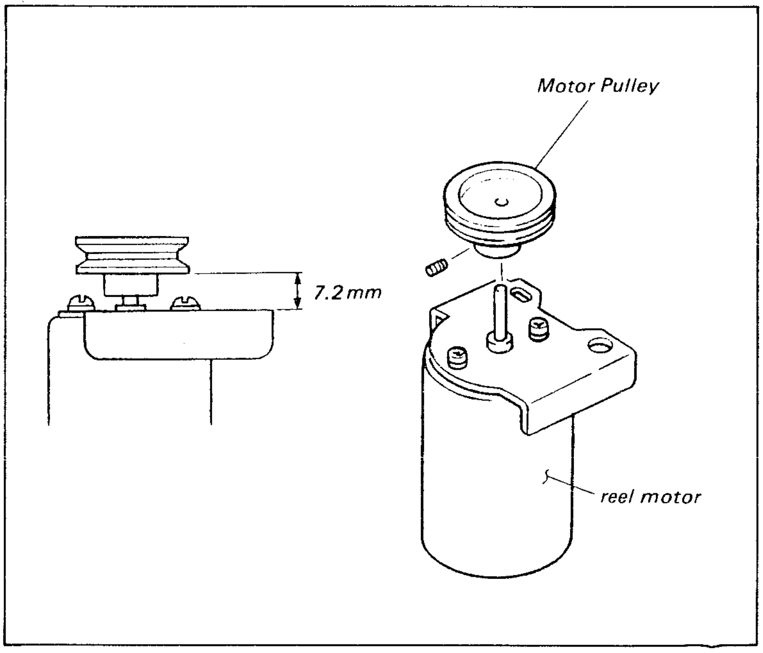
(1) Disconnect connector CN504/SV-57C Board.

(2) Remove the Reel Motor Block.

(3) Remove the Motor Pulley from the defective Reel Motor.

(4) Install this pulley in the new motor.

(5) Adjust the position of the Motor Pulley so that the clearance between the Motor Pulley and motor meets the required specification.



SECTION 6
LINK AND DRIVE SYSTEM ALIGNMENT

6-1. REEL TABLE HEIGHT ADJUSTMENT

. Because the Reel Table Height Adjustment functions as a reference in the entire tape run system, it is required that these adjustments be performed carefully.

Mode: Unthreading end

Tool: Reel table height check base jig
Reel table height check jig

Check procedure:

(1) Check that the "SO" and "TO" probes of the reel table height check jig slide over their respective Reel Table Flanges and that there is clearance between the flange and the probe.

(2) Check that the "SX" and "TX" probes are blocked by the flange.

.Use the "SO" and "SX" probes for the Supply Reel Table.

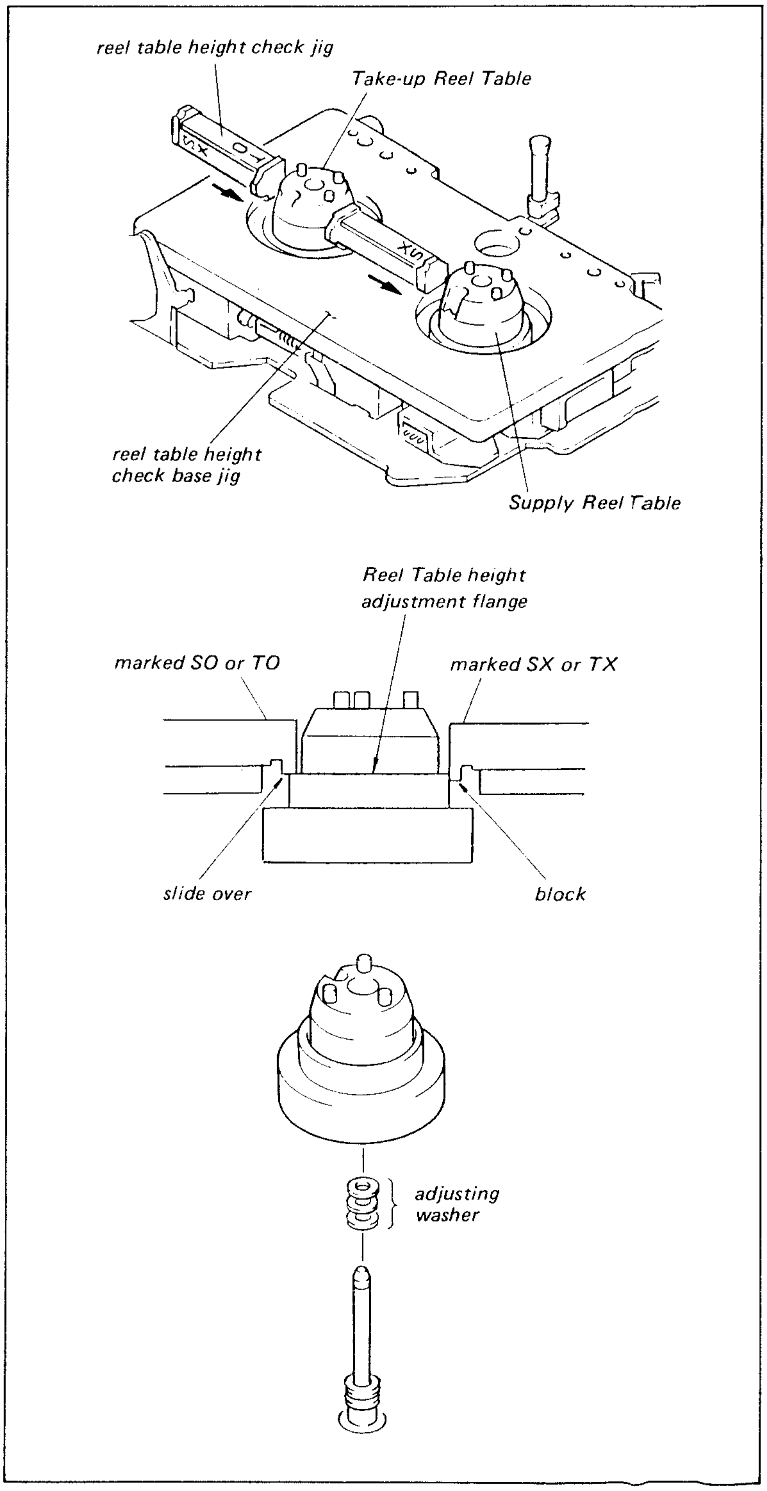
.Use the "TO" and "TX" probes for the Take-up Reel Table.

Adjustment procedure:

(1) Adjust with the washer under the Reel Table to meet the required specification.

Adjusting washer:

Poly Slider Washer, 3mm dia.
0.13 mm thick : 3-701-439-01
0.25 mm thick : 3-701-439-11
Guide Roller Washer, 3mm dia.
0.05 mm thick : 3-621-910-00
0.1 mm thick : 3-621-910-11



6-2. BRAKE SYSTEM ADJUSTMENT

6-2-1. T Soft Brake Clearance Adjustment

Mode: Unthreading end

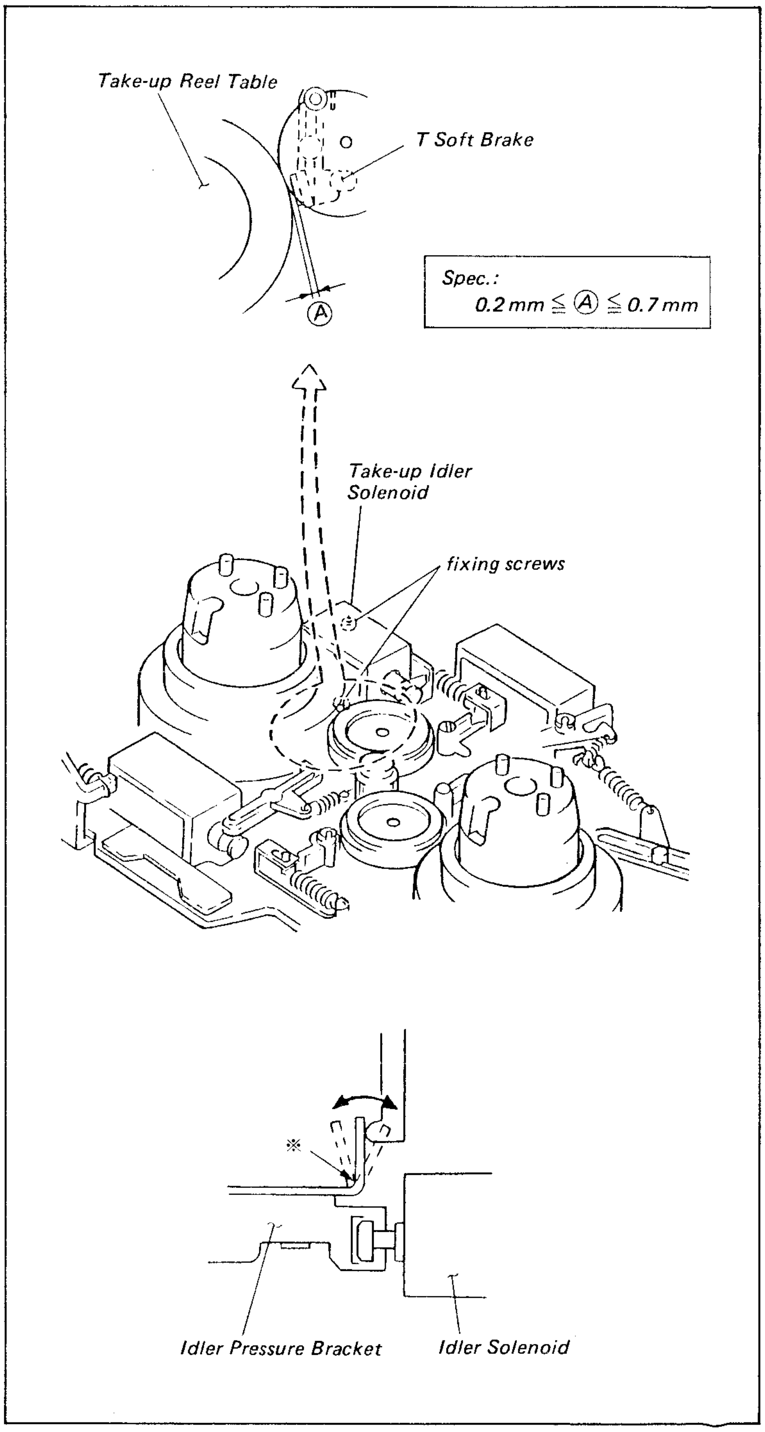
Tool: Thickness gauge

Check procedure:

(1) Push the plunger of the T Idler Solenoid in as far as possible by hand. Check that the clearance between Take-up Reel Table and T Soft Brake meets the required specification.

Adjustment procedure:

(1) Bend the ※ marked portion of the Idler Pressure Bracket in the direction of the arrow so that it meets the required specification.



6-2-2. S Soft Brake Clearance Adjustment (Unthreading end mode)

Mode: Unthreading end

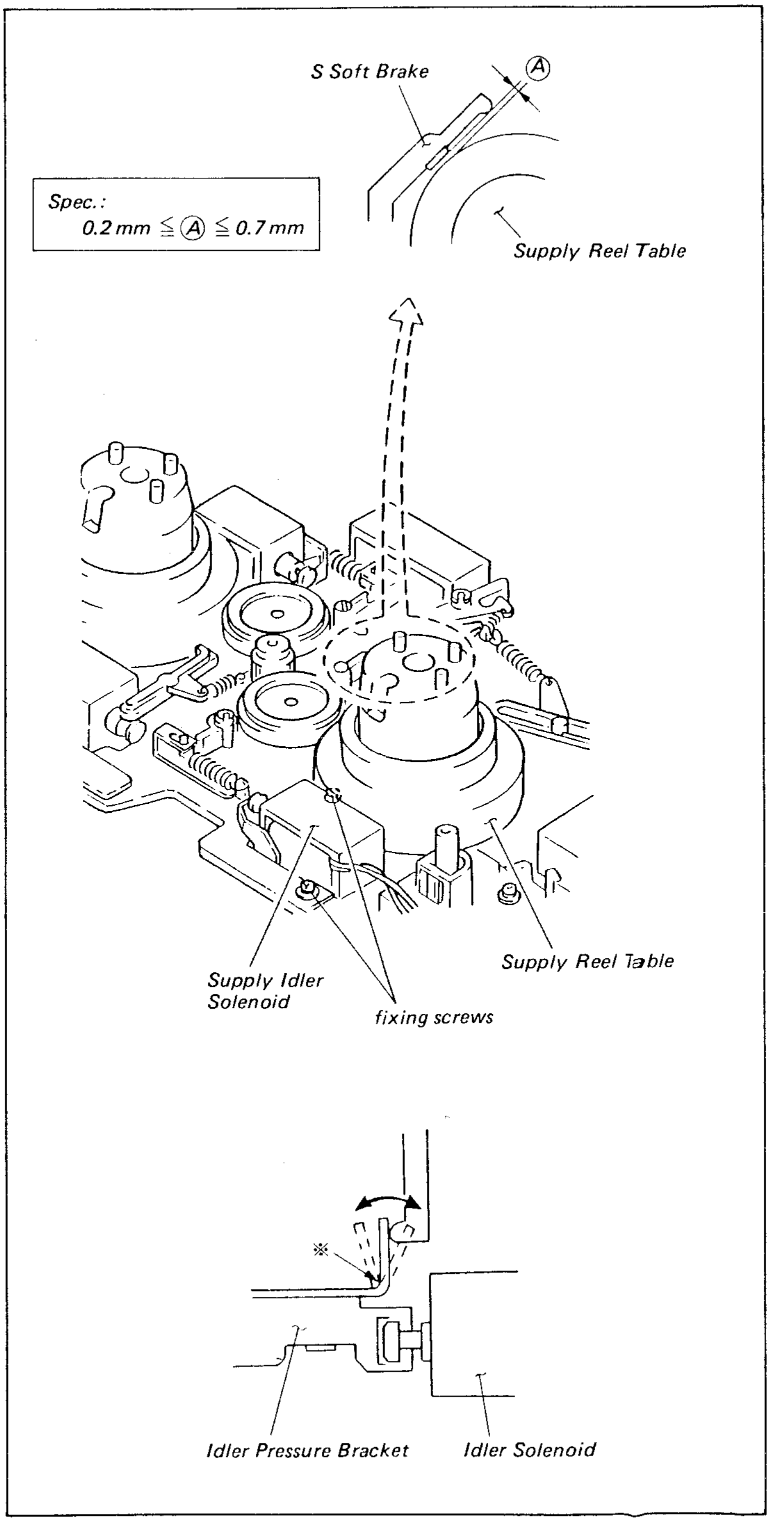
Tool: Thickness gauge

Check procedure:

(1) Push the plunger of the S Idler Solenoid in as far as possible by hand. Check that the clearance between the Supply Reel Table and the S Soft Brake meets the required specification.

Adjustment procedure:

(1) Bend the ※ marked portion of the Idler Pressure Bracket in the direction of the arrow so that it meets the required specification.



Spec.:
0.2 mm ≦ Ⓐ ≦ 0.7 mm

6-2-3. S Soft Brake Clearance Adjustment (Threading end mode)

Mode: Threading end

Tool: Thickness gauge

Check procedure:

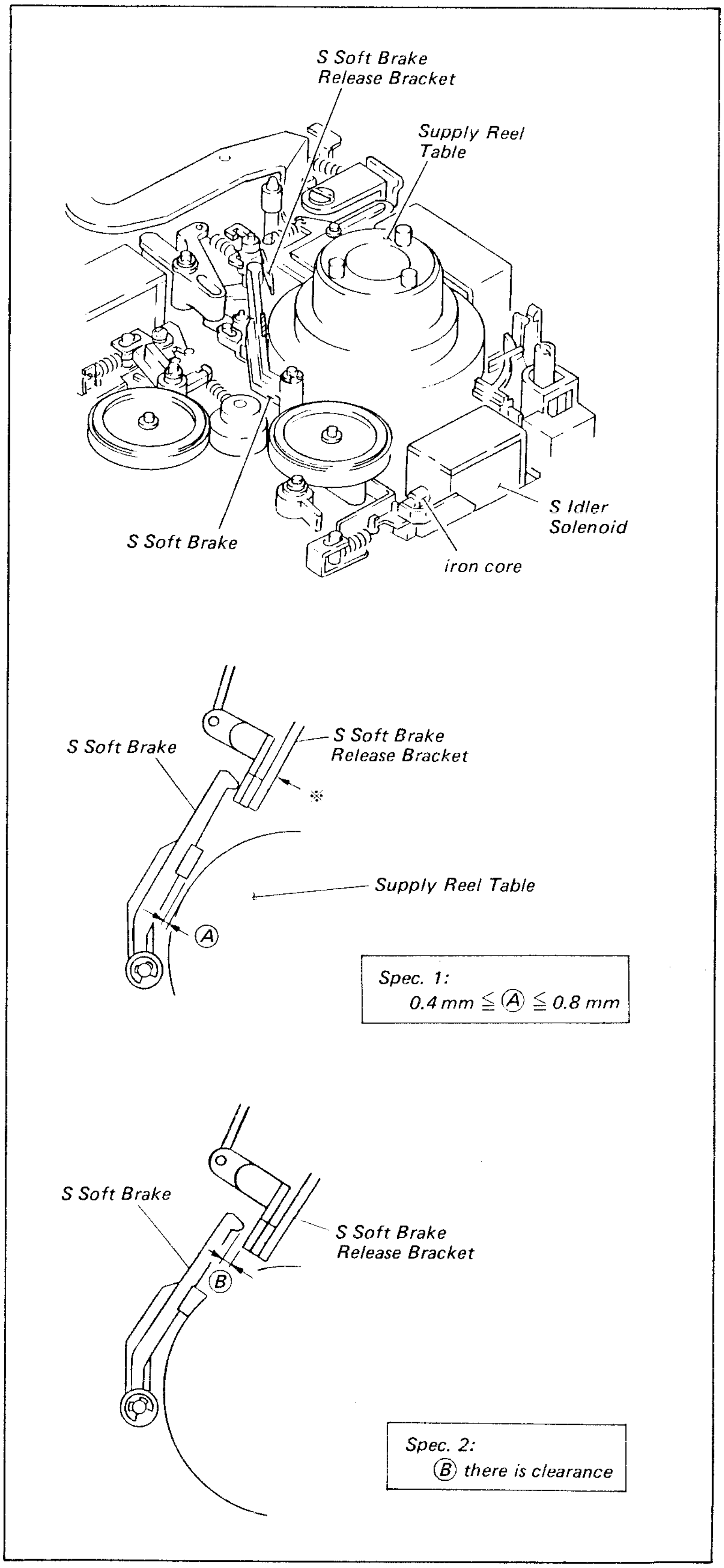
(1) Push the plunger of the Pinch Solenoid in as far as possible by hand. Check that the clearance between the Supply Reel Table and the S Soft Brake meets the required specification (1).

(2) Turn the Supply Reel Table by hand. Check that the clearance between the Supply Reel Table and the S Soft Brake meets the required specification (1) in every position.

(3) Release the plunger of the Pinch Solenoid from the fully engaged position. Check that the clearance between the S Soft Brake Arm and the S Soft Brake Release Bracket meets the required specification (2).

Adjustment procedure:

(1) Bend the ※ marked portion of the S Soft Brake Release Bracket in the direction of the arrow so that it meets the required specifications (1) and (2).



Spec. 1:
0.4 mm ≦ Ⓐ ≦ 0.8 mm

Spec. 2:
Ⓑ there is clearance

6-2-4. T Main Brake Clearance Adjustment

Mode: Unthreading end

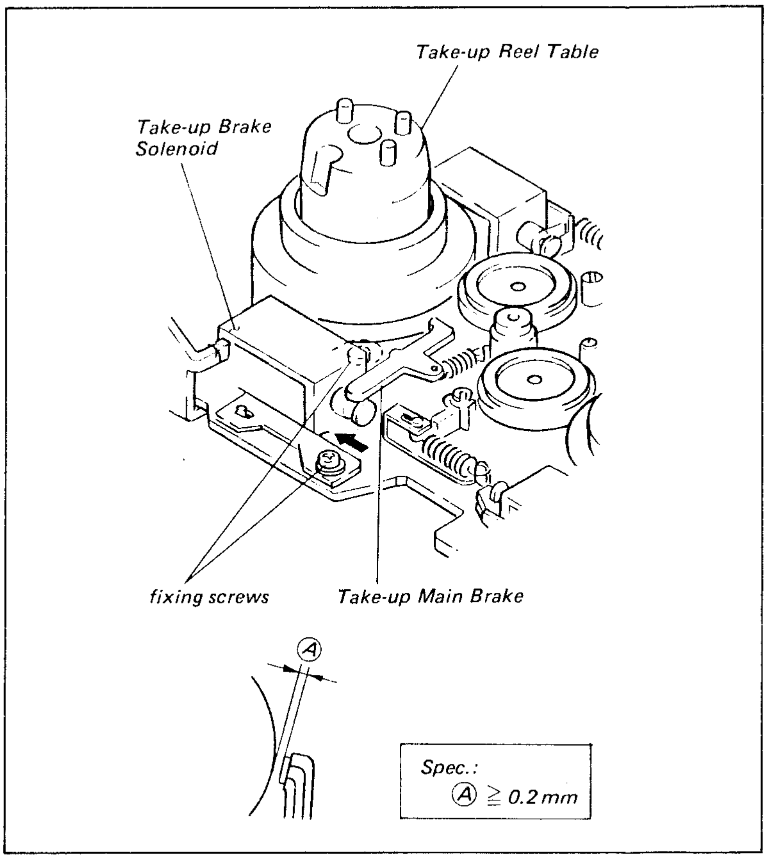
Tool: Thickness gauge

Check procedure:

(1) Push the plunger of the Take-up Brake Solenoid in as far as possible by hand. Check that the clearance between the Take-up Reel Table and the Take-up Main Brake meets the required specification.

Adjustment procedure:

(1) Adjust the position of the brake solenoid to meet the required specification.



6-2-5. S Main Brake Clearance Adjustment

Mode: Unthreading end

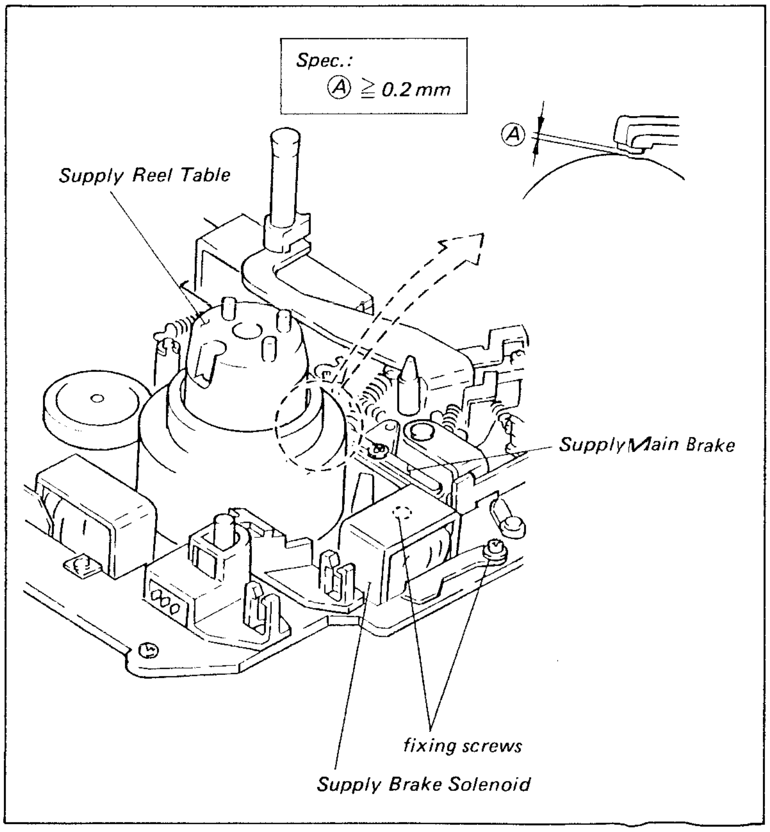
Tool: Thickness gauge

Check procedure:

(1) Push the plunger of the S Brake Solenoid in as far as possible by hand. Check that the clearance between the Supply Reel Table and the Supply Main Brake meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Brake Solenoid to meet the required specification.



6-3. IDLER SYSTEM ADJUSTMENT

6-3-1. T/S Idler Solenoid Mounting Position Adjustment

Mode: Unthreading end

Check procedure:

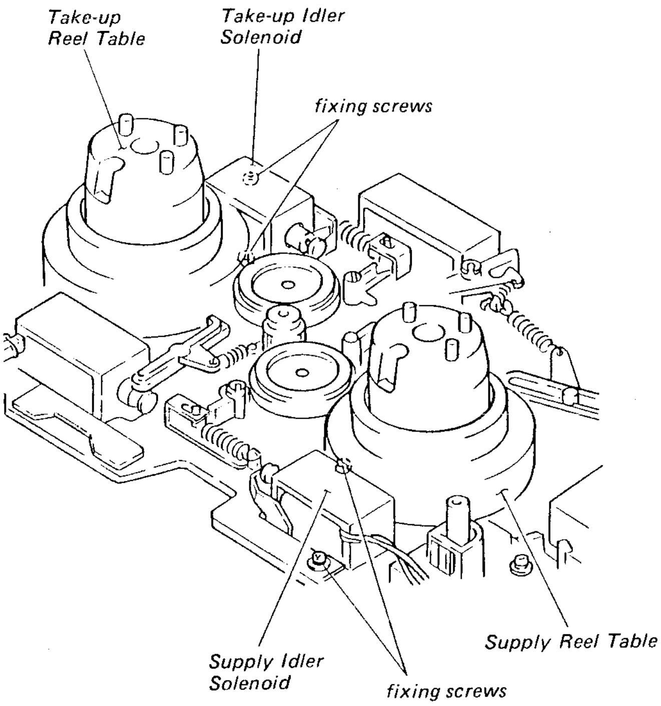
(1) Push the plunger of the S Idler Solenoid in as far as possible by hand. Check that the clearance between the end of the plunger and the Idler Solenoid Base meets the required specification.

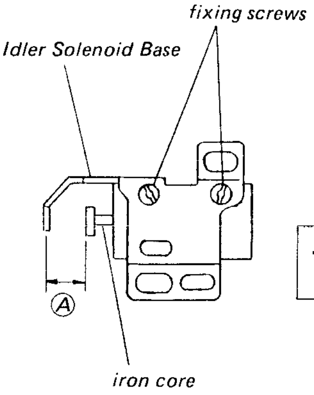
(2) Repeat Step (1) with the T Idler Solenoid. Check that the clearance between the end of the plunger of the T Idler Solenoid and the Idler Solenoid Base meets the required specification.

Adjustment procedure:

(1) Remove the Idler Solenoid Block from the machine.

(2) Adjust the mounting position of the Idler Solenoid to meet the required specification.





Spec.:
2.3 mm ≦ Ⓐ ≦ 2.7 mm

6-3-2. T Idler Pressure Bracket Clearance Adjustment

Mode: Unthreading end

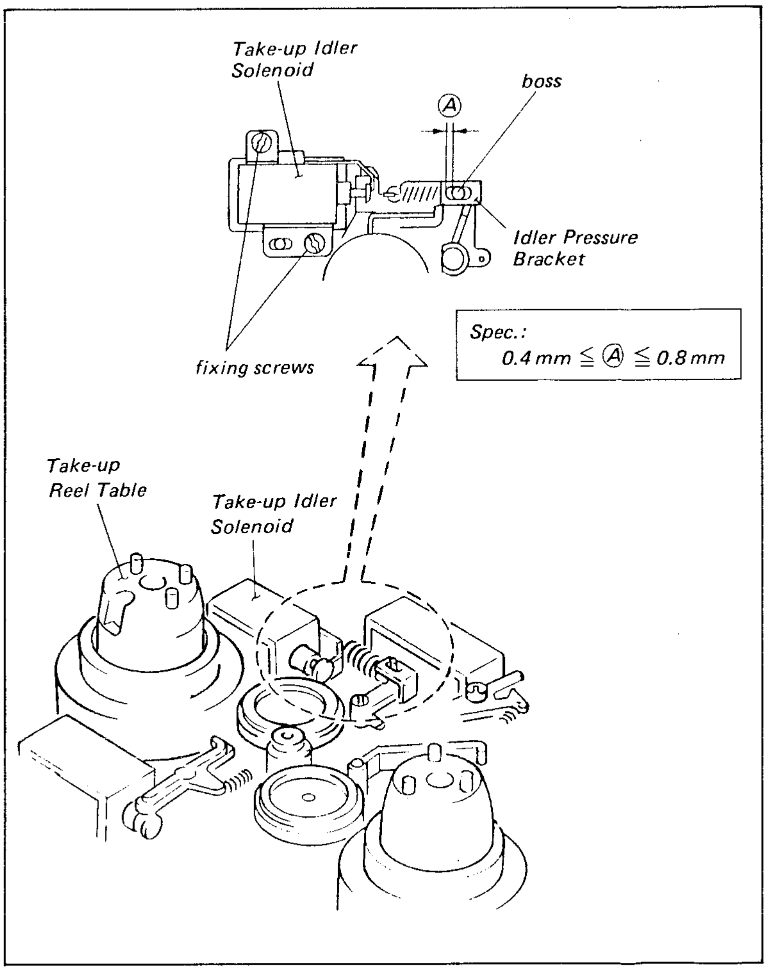
Tool: Thickness gauge

Check procedure:

(1) Push the plunger of the T Idler Solenoid in as far as possible by hand. Check that the clearance between the boss and the Idler Pressure Bracket meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Idler Solenoid to meet the required specification.



6-3-3. S Idler Pressure Bracket Clearance Adjustment

Mode: Unthreading end

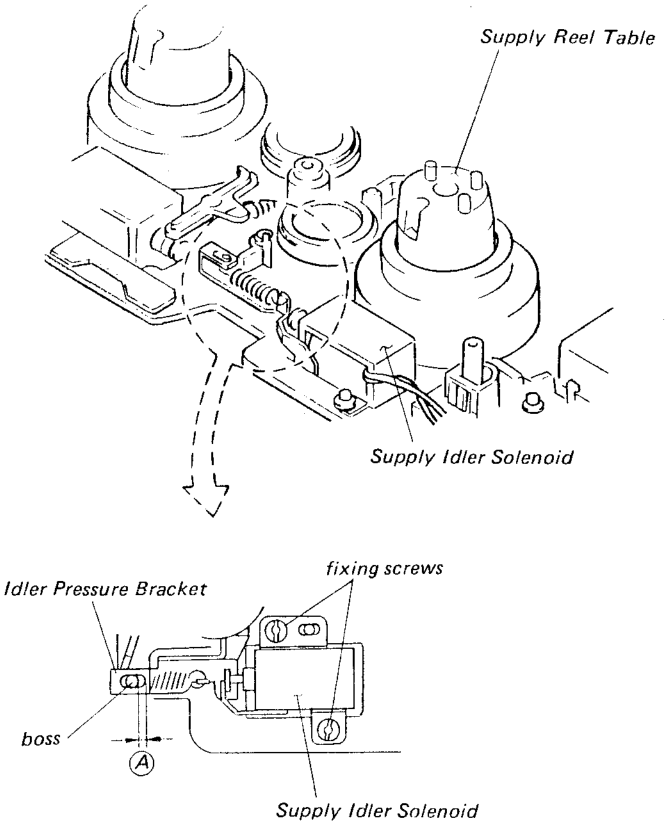
Tool: Thickness gauge

Check procedure:

(1) Push the plunger of the S Idler Solenoid in as far as possible by hand. Check that the clearance between the boss and the Idler Pressure Bracket meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Idler Solenoid to meet the required specification.



Spec.:
0.4 mm ≦ Ⓐ ≦ 0.8 mm

6-4. TENSION REGULATOR SOLENOID MOUNTING POSITION ADJUSTMENT

Mode: Unthreading end

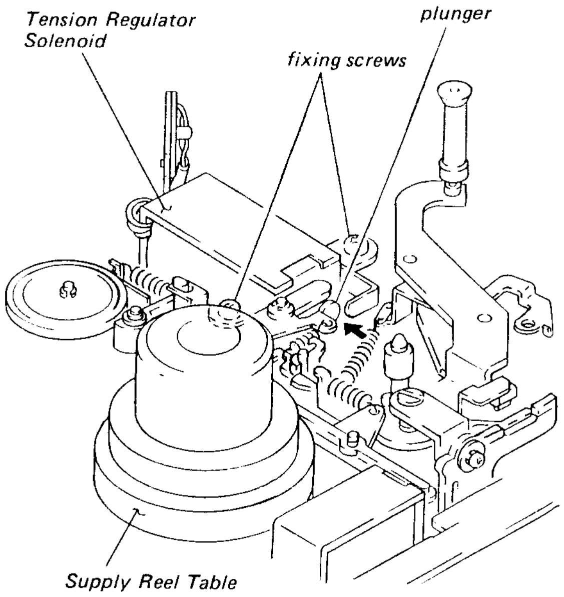
Check procedure:

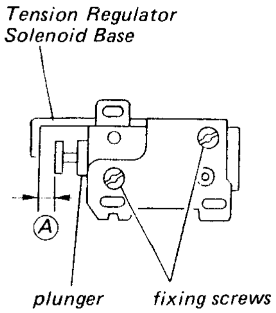
(1) Push the plunger of the Tension Regulator Solenoid in as far as possible by hand. Check that the clearance between the end of the plunger and the Tension Regulator Solenoid Base meets the required specification.

Adjustment procedure:

(1) Remove the Tension Regulator Block from the machine.

(2) Adjust the mounting position of the Tension Regulator Solenoid to meet the required specification.





Spec.:
3.2 mm ≦ Ⓐ ≦ 3.6 mm

6-5. SWITCH SYSTEM ADJUSTMENT

6-5-1. Cassette-in Switch ON Point Adjustment

Mode: Unthreading end

Tool: Reel table height check base jig
Small mirror for adjustment

Check procedure:

(1) Place the reel table height check base jig on the Cassette Pillars of the drum side as shown in the figure.

(2) Slowly lower the reel table height check base jig in the direction of the arrow.

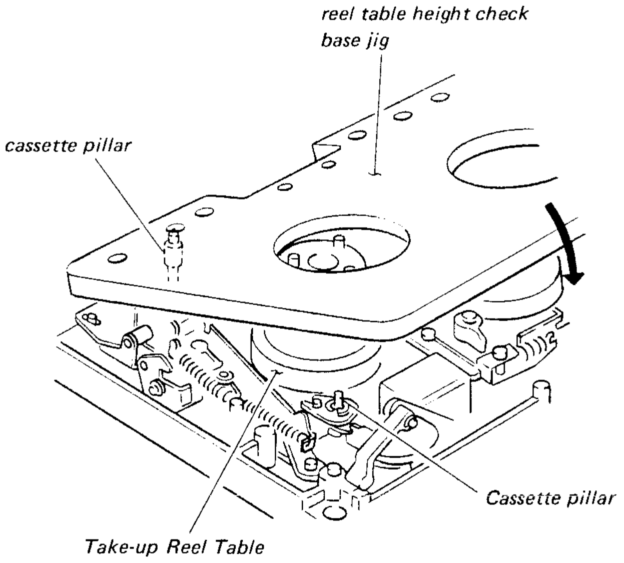
(3) When the Cassette-in Switch is turned ON (listen for the click sound), check that the clearance between the Cassette Pillar and the jig meets the required specification (1).

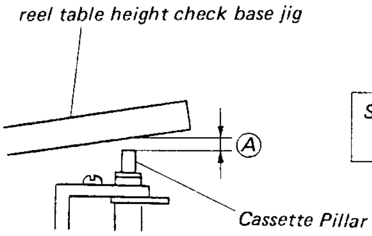
(4) Place the reel table height check base jig on the Cassette Pillars.

(5) Press down on the Switch Pin. Check that this switch pin moves. (Spec.(2))

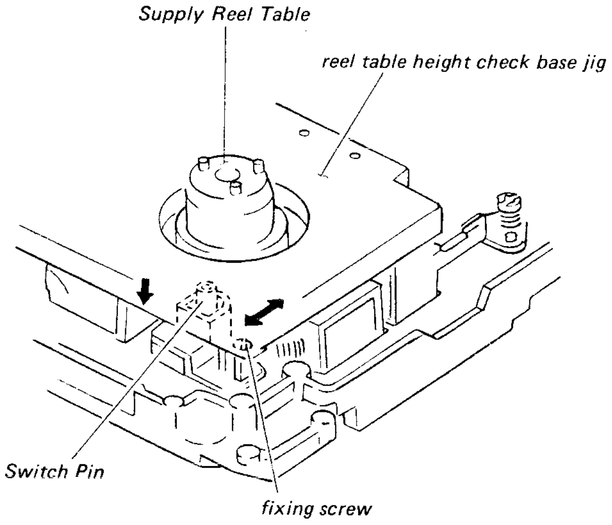
Adjustment procedure:

(1) Move the position of the Cassette-in Switch Block in the direction of the arrow to meet the required specifications (1) and (2).





Spec. 1:
1.2mm ≦ Ⓐ ≦ 2.2mm



Spec. 2:
move the switch pin

6-5-2. Mis-recording Switch Position Adjustment

Mode: Unthreading end

Tool: Cassette tape (Never use the alignment tape)
Small mirror for adjustment

Check procedure:

(1) Check that the red cap is installed in the Erroneous-erasure-prevention Hole of the cassette tape. Put the cassette tape in home position.

(2) Check that the VTR can be put into the Record mode.

(3) Remove the cassette tape.

(4) Apply three pieces of vinyl tape on the red cap as shown in the figure.

(5) Put the cassette tape in home position again.

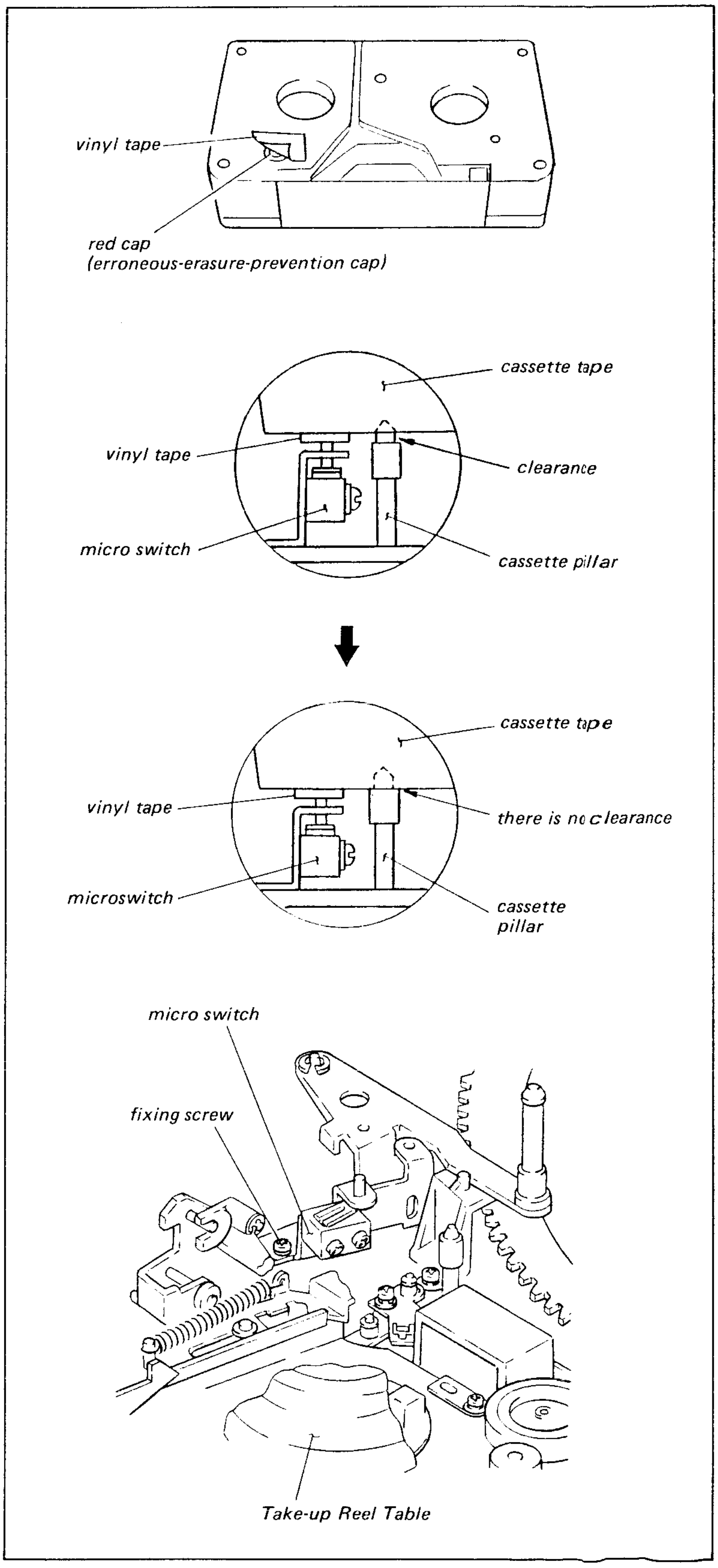
(6) Check with mirror that there is no clearance between the Cassette Pillar and the cassette tape.

Adjustment procedure:

(1) Remove the Mis-recording Switch Block from the machine.

(2) Adjust the position of the microswitch to meet the required specification.

(3) Install the Mis-recording Switch Block in the machine and check it again.



6-5-3. Cassette Lock Switch Position Adjustment

. This adjustment is performed with the Cassette-up Compartment installed in the VTR.

Mode: Cassette up

Tool: Circuit tester
Oscilloscope

Preparation:

(1) Connect the oscilloscope to IC4, Pin 4/SY-18C Board.

Check procedure:

(1) Insert the cassette-tape into the Cassette-up Compartment.

(2) Depress the Cassette-up Compartment slowly.

(3) Check that the level changes from High to Low before the Cassette-up Compartment locks.

(4) Depress the Cassette-up Compartment further until it locks.

(5) Check that the level changes from Low to High soon after the compartment locks.

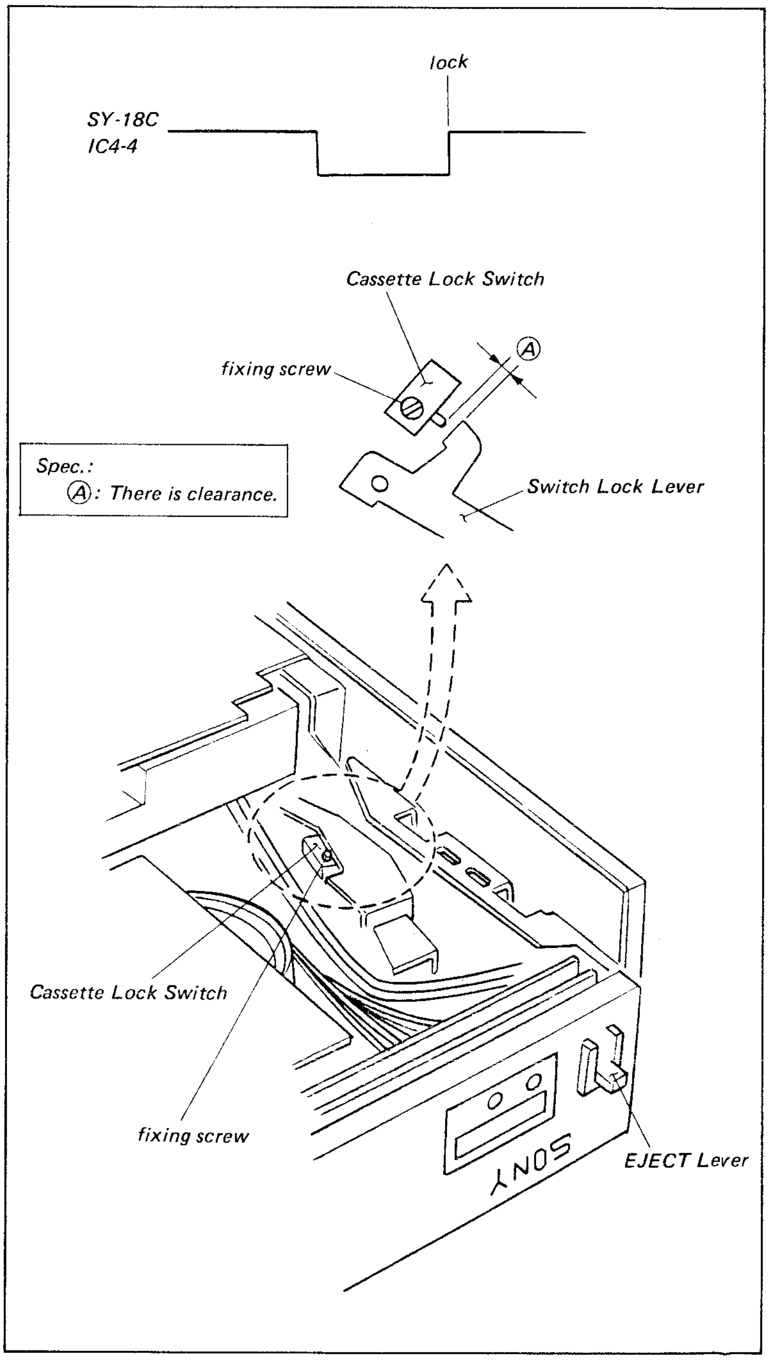
(6) Open the printed circuit board, and locate the Cassette Lock Switch.

(7) Perform the Steps (1) and (2) again.

(8) Check that there is clearance between the Switch Lock Lever and the microswitch when the Cassette Lock Switch is in the ON position.

Adjustment procedure:

(1) Adjust the position of the Cassette Lock Switch to meet the required specification.



Spec.:
Ⓐ: There is clearance.

6-5-4. Lead Switch Clearance Adjustment

. This adjustment is required only when the lead switch of the Tension Regulator is replaced or removed.

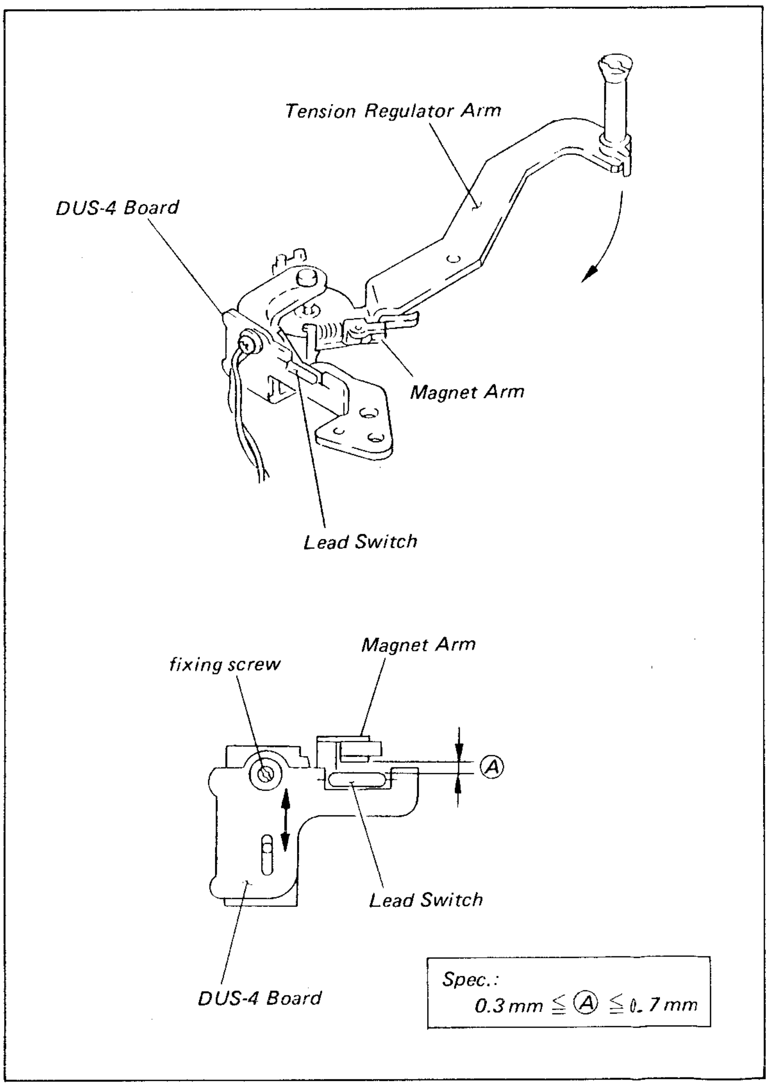
Tool: Thickness gauge

Check procedure:

(1) Check that the clearance between the magnet and the lead switch of the Magnet Arm Block meets the required specification.

Adjustment procedure:

(1) Adjust the position of the DUS-4 Board to meet the required specification.
(NOTE: Don't press the excessive forth to the lead switch.)



Spec.:
0.3 mm ≦ Ⓐ ≦ 0.7 mm

6-5-5. Eject Switch ON Point Adjustment

Mode: Unthreading end

Check procedure:

(1) Press slowly on the EJECT button, and move the E Stopper in the direction of the arrow.

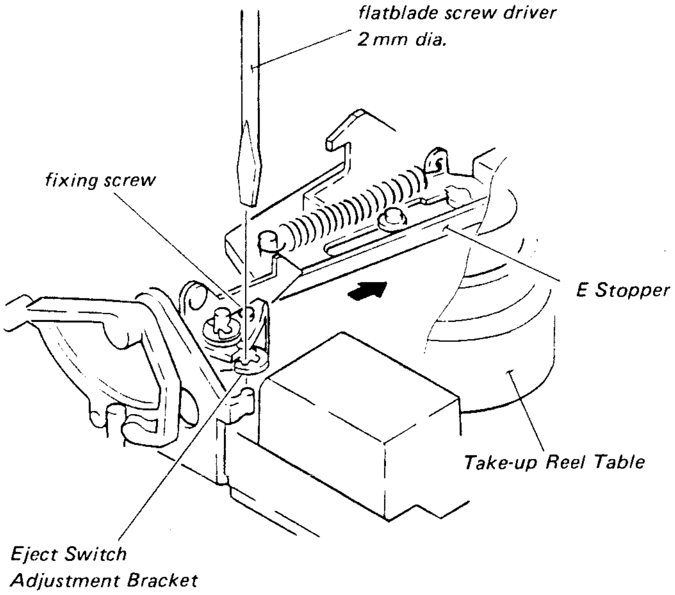
(2) With the Eject Switch is in the ON position (listen for click sound), check that the positional relationship between the U groove of the E Stopper and the round hole in the chassis meets the required specification.

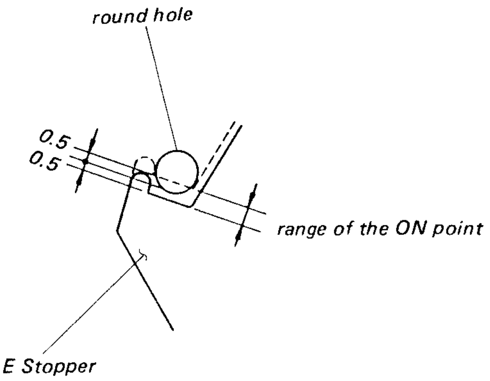
(Supplement to the specification: the switch must turn ON while the top of the U groove of the E Stopper is between a point 0.5mm ahead of the round hole in chassis and a point 0.5mm behind of the round hole.)

Adjustment procedure:

(1) Loosen the fixing screw of the Eject Switch Adjustment Bracket about 1/2 to 1 turn.

(2) Insert a flatblade screwdriver (2mm dia.) into the adjusting hole and adjust the position of the Eject Switch Adjustment Bracket so that it meets the required specification.





6-6. PC-22 BOARD MOUNTING POSITION ADJUSTMENT

. This adjustment is required when the Photo Interrupter of the PC-22 Board is replaced.

Mode: Unthreading end

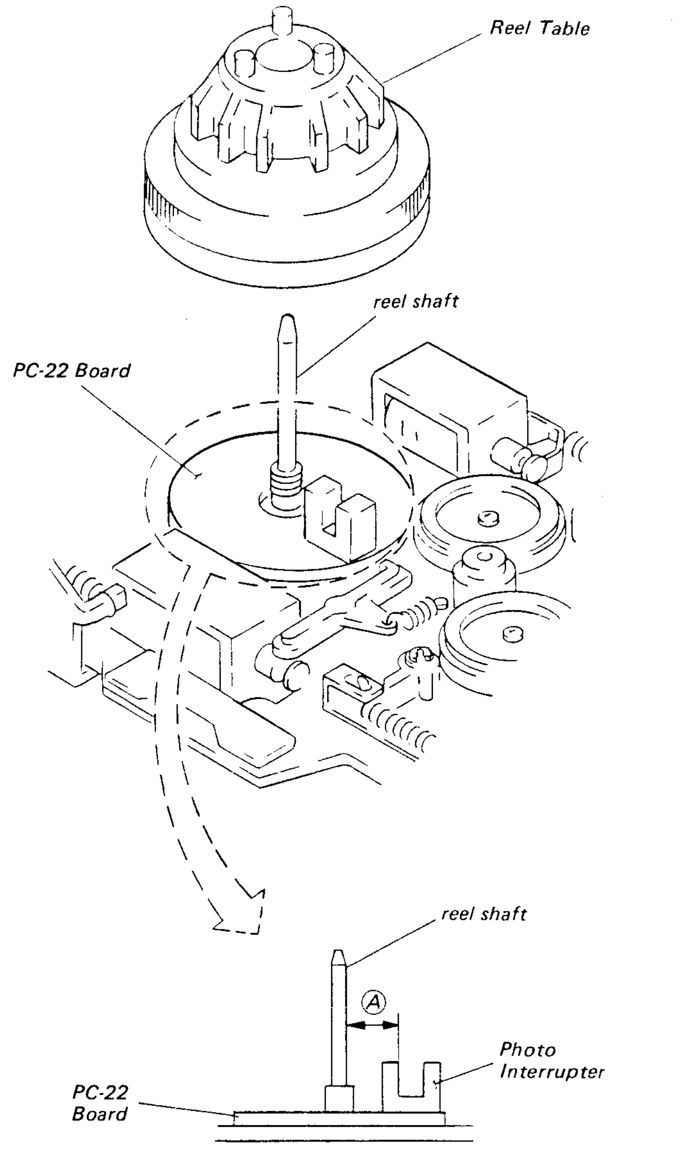
Tool: Scale

Check procedure:

(1) Check that the distance (shown in the figure) between the outside of the reel shaft and the Photo Interrupter meets the required specification.

Adjustment procedure:

(1) Adjust the mounting position of PC-22 Board to meet the required specification.

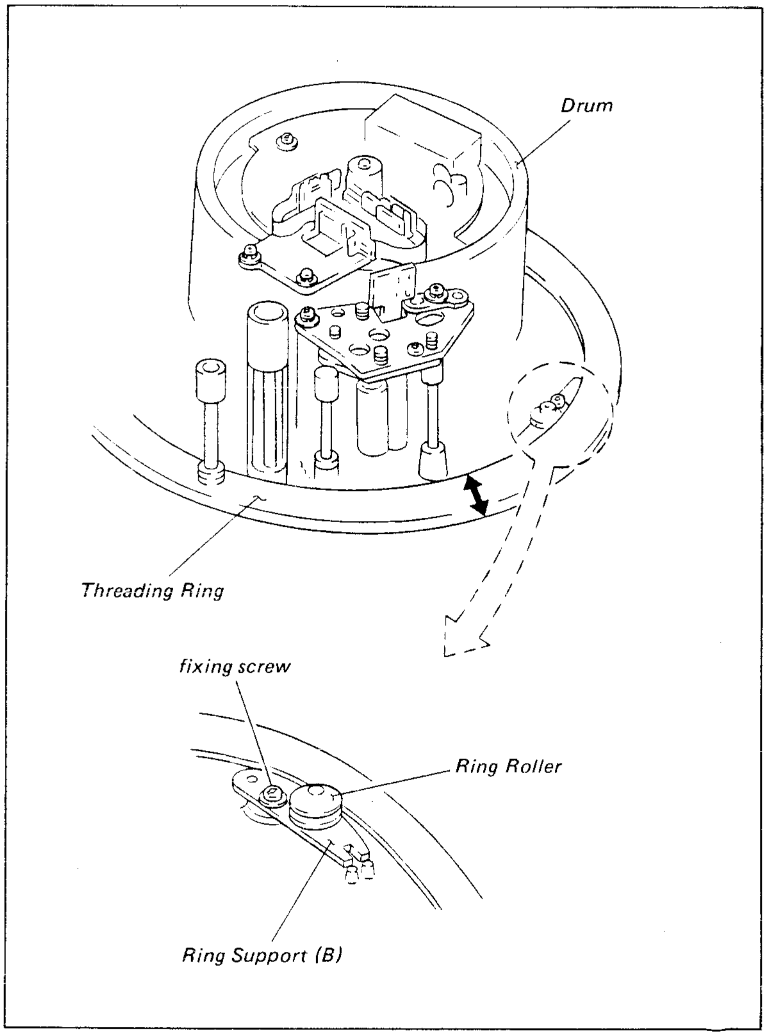


Spec.:
9.3 mm ≦ Ⓐ ≦ 9.7 mm

6-7. THREADING SYSTEM ADJUSTMENT

6-7-1. Threading Ring Rotation Adjustment

. This adjustment is required when the Threading Ring or Ring Support is replaced.



Mode:

(1) Turn the Threading Ring until the ring is turned back 180 degrees from the unthreading-end state.

Check procedure:

(1) Check that the horizontal play exists when the Threading Ring is pushed by hand in the direction of the arrow. direction of the arrow.

(2) Check that the rotation of the Threading Ring into the threading mode and the unthreading mode is smooth.

Adjustment procedure:

(1) Adjust the position of the Ring Support (B) Assy to meet the required specification.

Adjusting procedure;

- Insert a 0.2mm thick piece of paper between the Threading Ring and the Ring Roller.
- The paper of this manual is about 0.1mm thick; therefore two sheets would be 0.2 mm thick.

6-7-2. Threading Ring Engaging Adjustment

Mode: Unthreading end

Tool: 0.5mm dia. clearance check gauge

Check procedure:

(1) Check that the clearance between the Threading Ring and the gear of the gear box meets the required specification.

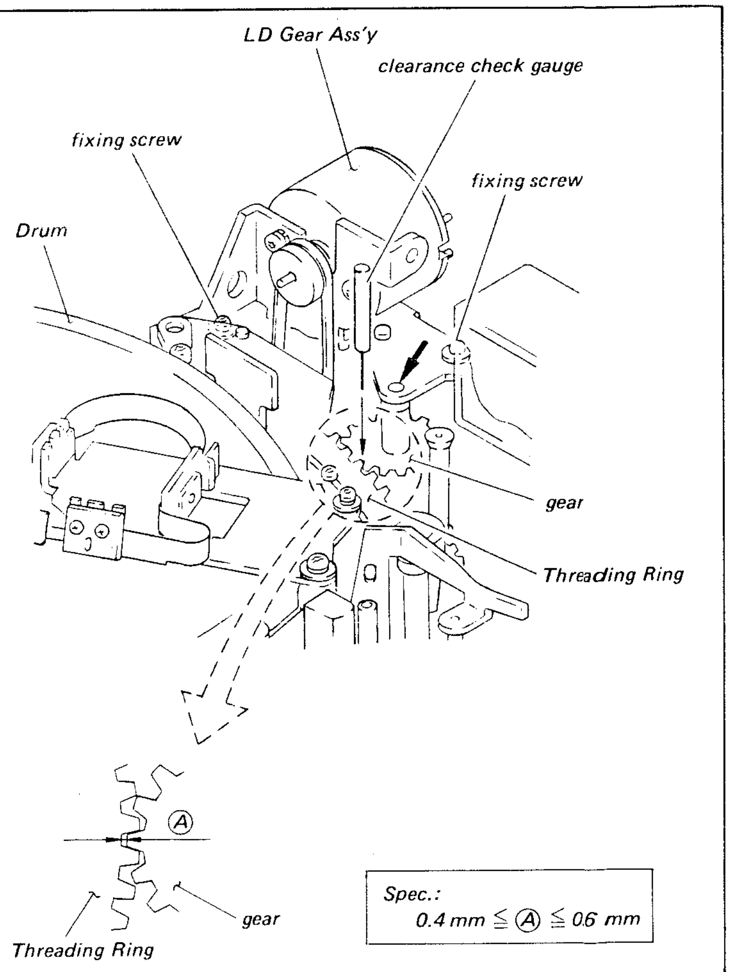
Adjustment procedure:

(1) Loosen the fixing screws of the gear box about 1 to 2 turns.

(2) Insert the 0.5mm dia. clearance check gauge between the Threading Ring and the gear of the gear box.

(3) Press the gear box lightly toward the Threading Ring.

(4) Tighten the fixing screws of the gear box, and check that the clearance meets the required specification.



6-7-3. Threading/Unthreading Switch Position Adjustment

Mode:

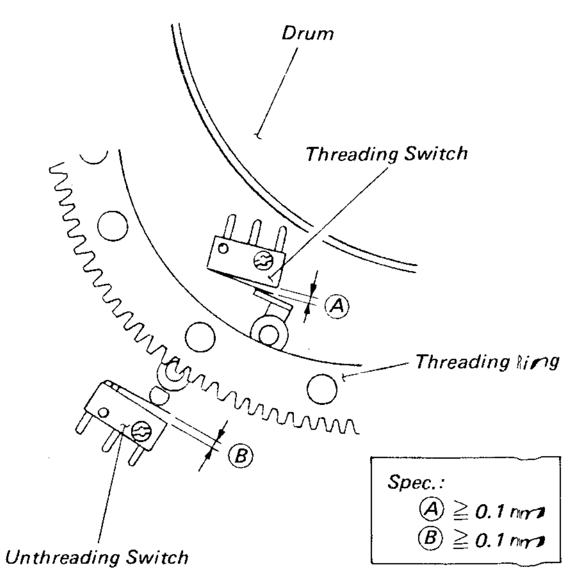
(1) Turn the LD Pulley of the gear box block from the unthreading-end state until the Unthread End Switch is turned ON.

Check procedure:

(1) Check that the clearances (A) and (B) between the micro switch and the actuators meet the required specifications.

Adjustment procedure:

(1) Adjust the position of each micro switches to meet the required specifications.



6-7-4. Threading Ring Stop Position Adjustment

Mode: Threading end

Tool: Thickness gauge

Check procedure:

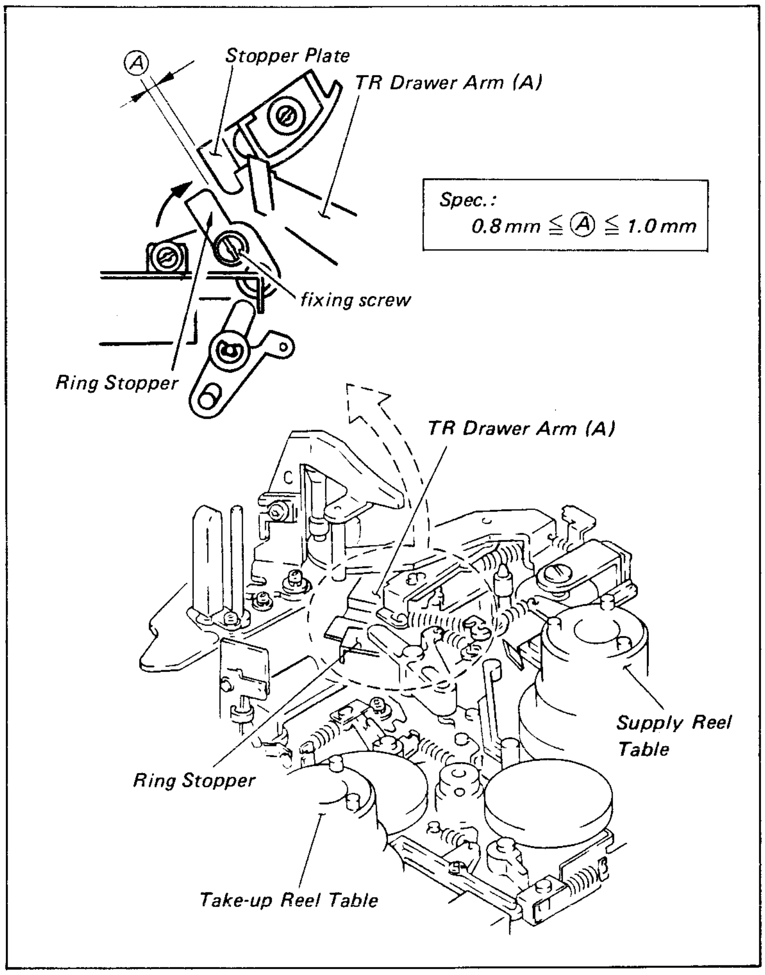
(1) Turn the pulley of the gear box block by hand in the unthreading direction until the belt slips.

(2) Check that the clearance between the Stopper Plate and the Ring Stopper meets the required specification.

Adjustment procedure:

(1) Loosen the fixing screw of the Ring Stopper about 1 turn.

(2) Move the Ring Stopper in the direction of the arrow so that it meets the required specification.



Spec.:
0.8mm ≦ Ⓐ ≦ 1.0mm

6-7-5. Tape Stopper Position Adjustment

Mode: Unthreading end

Tool: Thickness gauge

Check procedure:

(1) Push the plunger of the Tension Regulator Solenoid in as far as possible by hand. Check that the clearance (A) between the Capstan and the Pinch Roller, and between the Pinch Roller Flange and the Pinch Press Lever meet the required specification.
(Spec 1)

(2) Push the plunger of the Pinch Solenoid to ON state in as far as possible by hand. Check that the clearance (C) between the Pinch Roller and the Tape Stopper. (Spec.2)

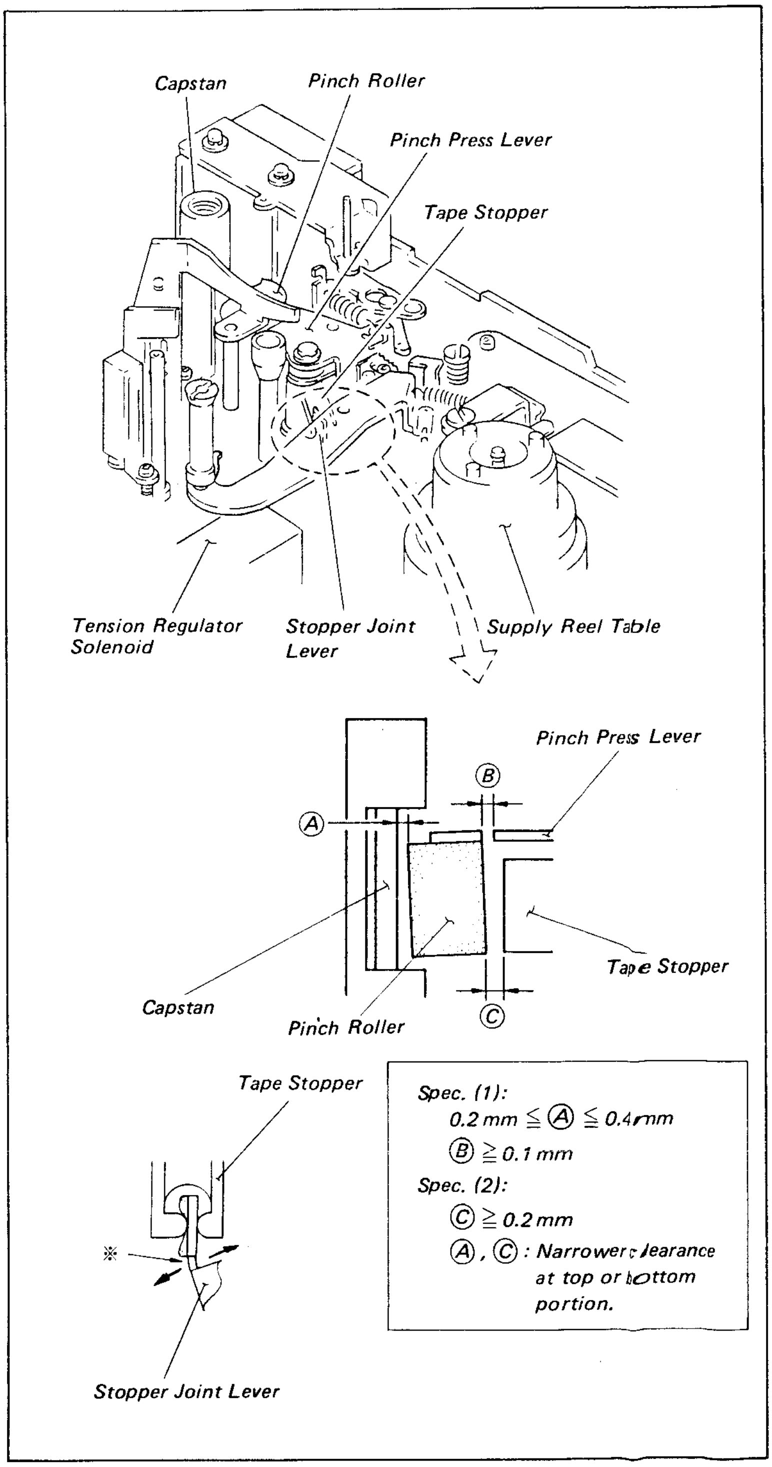
Adjustment procedure:

(1) Push the plunger of the Tension Regulator Solenoid in as far as possible by hand.

(2) Bend the ※ marked portion of the Stopper Joint Lever to meet the required specification.

(3) Put the Pinch Solenoid into ON state.

(4) Check Spec (2).
If it does not meet the required specification, repeat Steps (1) and (2) to meet the required specification.



Spec. (1):
0.2 mm ≦ Ⓐ ≦ 0.4 mm
Ⓑ ≧ 0.1 mm
Spec. (2):
Ⓒ ≧ 0.2 mm
Ⓐ, Ⓒ : Narrower clearance at top or bottom portion.

6-8. S-TENSION REGULATOR ARM OPERATING POSITION ADJUSTMENT

6-8-1. S-tension Regulator Arm Operating Position Adjustment

Mode: Playback mode

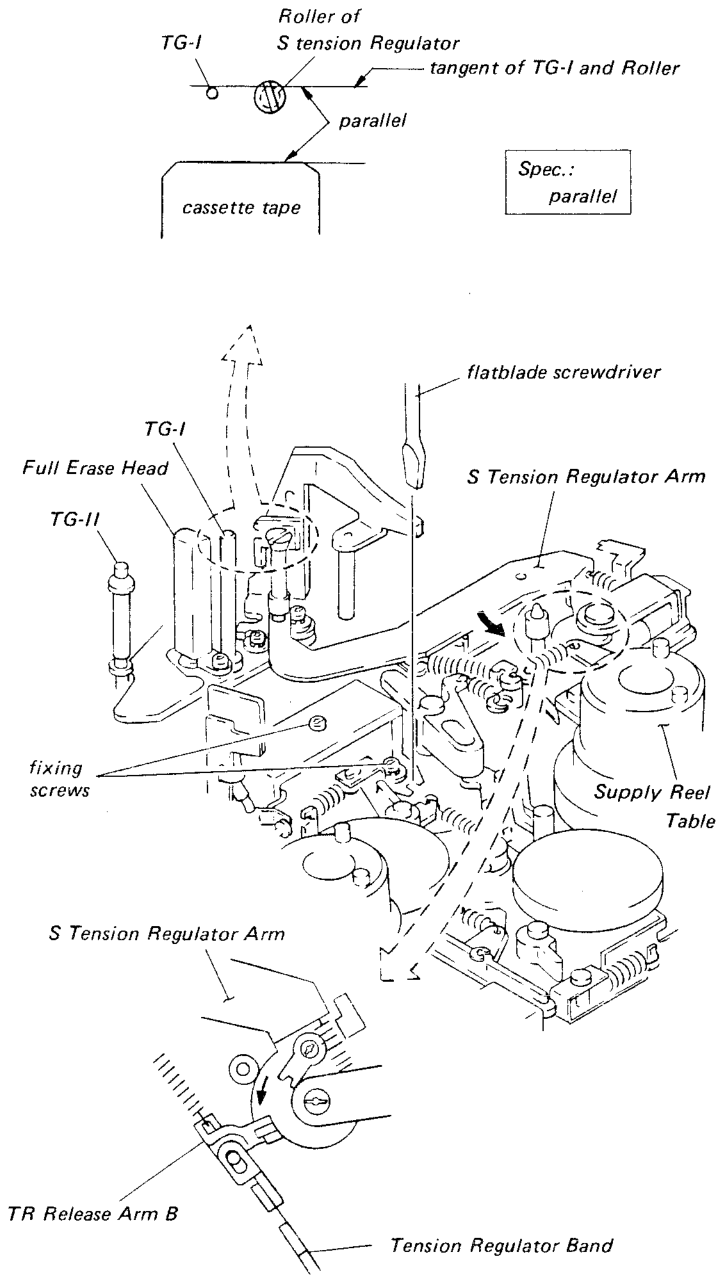
Tool: Cassette tape

Check procedure:

(1) Insert the cassette tape, and put the machine into the PLAY mode. Check that the positional relationship between the roller of the S-tension Regulator Arm and TG-I meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Tension Regulator Solenoid to meet the required specification.



6-8-2. TR Stopper A Clearance Adjustment

Mode: PLAY mode without cassette tape

Tool: Thickness gauge

Check procedure:

(1) Put the machine into the PLAY mode without a cassette tape.

(2) Check that the iron core of the S Tension Regulator Solenoid is energized completely.

(3) Move the S Tension Regulator Arm in the direction of the arrow C with finger so that the S Tension Regulator Arm contacts the boss of the TR Release Arm (B).

(4) Check that the clearance between the S Tension Regulator Arm and the TR Stopper A meets the required specification.

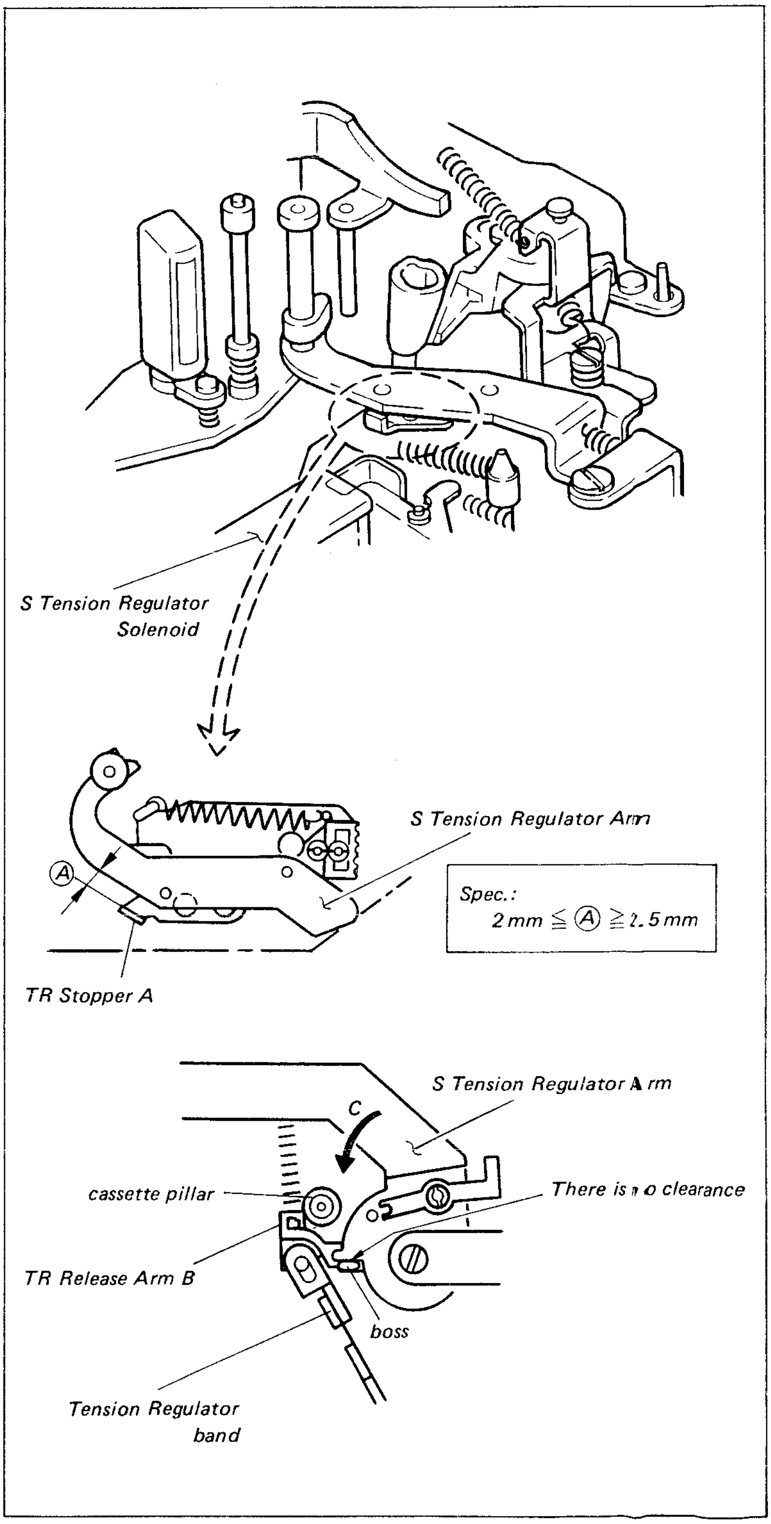
Adjustment procedure:

(1) Put the machine into STOP mode.

(2) Loosen the fixing screw of the TR Stopper A about 1/4 to 1/2 turn.

(3) Move the TR Stopper A to meet the required specification.

(4) Put the machine into the PLAY mode without cassette tape, and check that the clearance meets the required specification.



Spec.:
2mm ≦ Ⓐ ≧ 2.5mm

6-9. PINCH PRESS MECHANISM BLOCK ADJUSTMENT

6-9-1. Pinch Press Mechanism Block Position Adjustment

Mode: PLAY mode without a cassette tape

Tool: Thickness gauge

Check procedure:

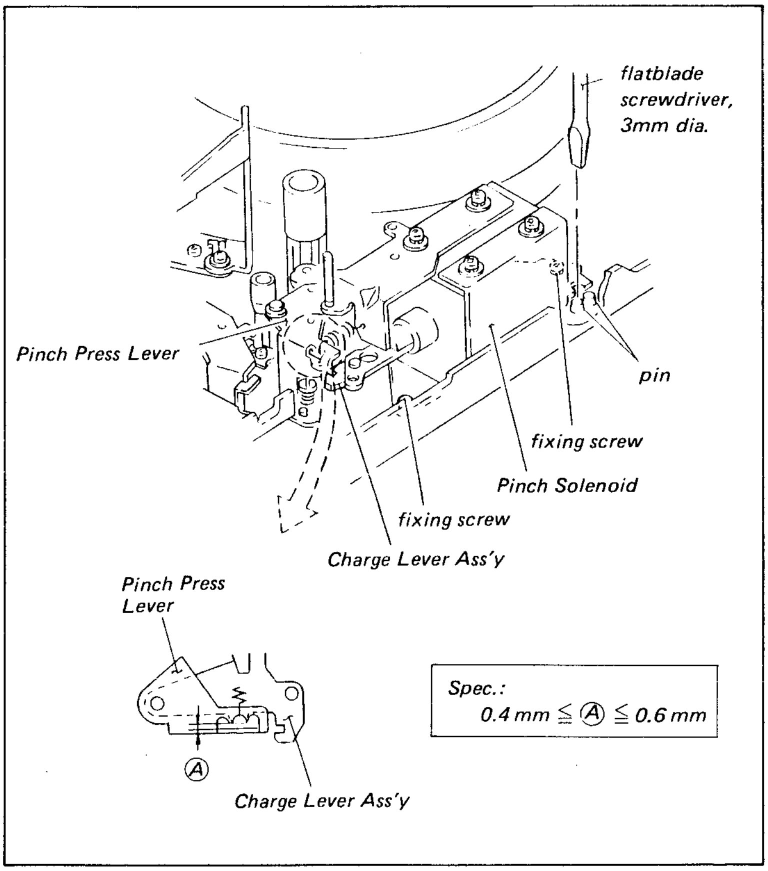
(1) Put the machine into the PLAY mode without a cassette tape.

(2) Check that the clearance between the Pinch Press Lever and Charge Lever meets the required specification.

Adjustment procedure:

(1) Loosen the fixing screws of the Pinch Press Mechanism Block about 1/2 to 1 turn.

(2) Insert a flatblade screwdriver (3mm dia.) into the notch of the Pinch Press Mechanism Block, and adjust the Pinch Press Mechanism Block position to meet the required specification.



Spec.:
0.4 mm ≦ Ⓐ ≦ 0.6 mm

6-9-2. PM Arm Clearance Adjustment

Mode: Threading end mode ⟶ PLAY mode

Check procedure:

(1) Put the machine into the threading-end mode.

(2) Check that the Pinch Solenoid is not energized.

(3) Check that the clearance (A) between the PM Arm and the Power Link A of the TR Drawer Arm Sub Assy meets the required specification.

(4) Put the machine into the PLAY mode.

(5) Check that the Pinch Solenoid is energized.

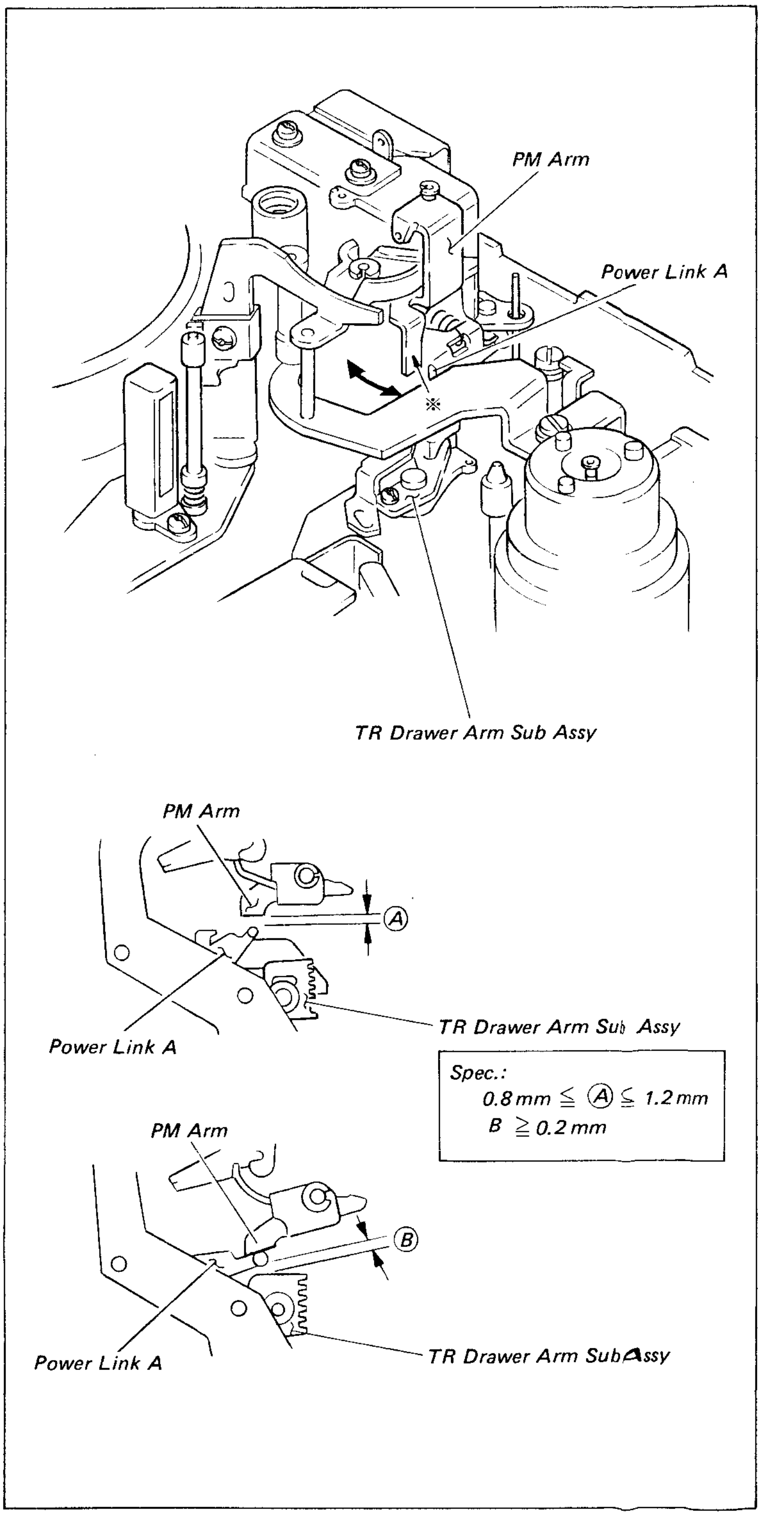
(6) Check that the clearance (B) between the TR Drawer Arm B and the Power Link A meets the required specification.

Adjustment procedure:

(1) Put the machine into the unthreading-end mode.

(2) Bend the ※ portion of the PM Arm.

(3) Check as check procedure, check that the clearances (A) and (B) meet the required specification.



Spec.:
$0.8\,mm \leqq Ⓐ \leqq 1.2\,mm$
$B \geqq 0.2\,mm$

6-10. E SLIDER ADJUSTMENT

6-10-1. E Slider Position Adjustment

Mode: Threading end

Tool: Thickness gauge

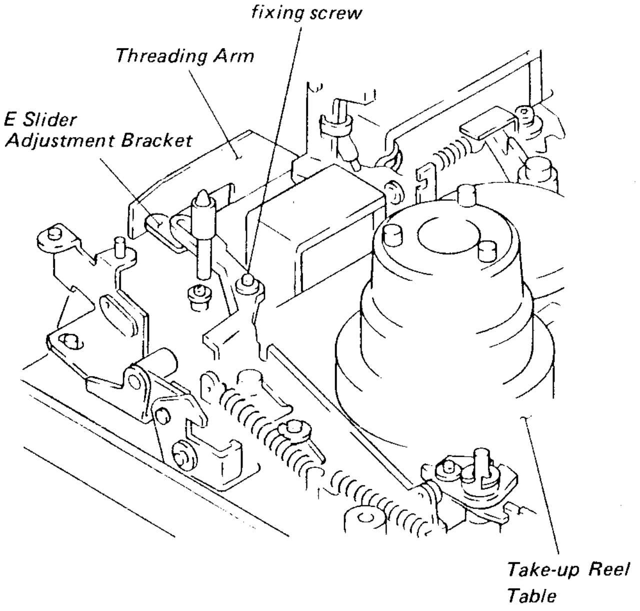
Check procedure:

(1) Check that the clearance between the Threading Arm and the E Slider Adjustment Bracket meets the required specification.

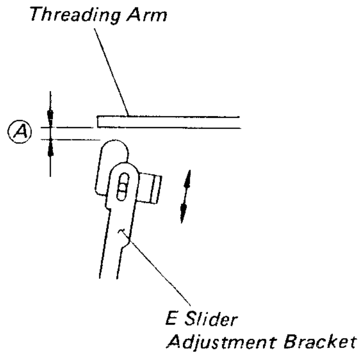
Adjustment procedure:

(1) Loosen the fixing screws of the E Slider Adjustment Bracket about 1/2 to 1 turn.

(2) Adjust the position of the E Slider Adjustment Bracket to meet the required specification.



Spec.:
0.5 mm ≦ Ⓐ ≦ 1 mm



6-10-2. E Slide Stopper Position Adjustment

Mode: Unthreading end

Tool: Thickness gauge

Check procedure:

(1) Press slowly on the EJECT button, and move the E Slider Assy in the direction of arrow A. Check that the clearance between the roller and the E Stopper meets the required specification.

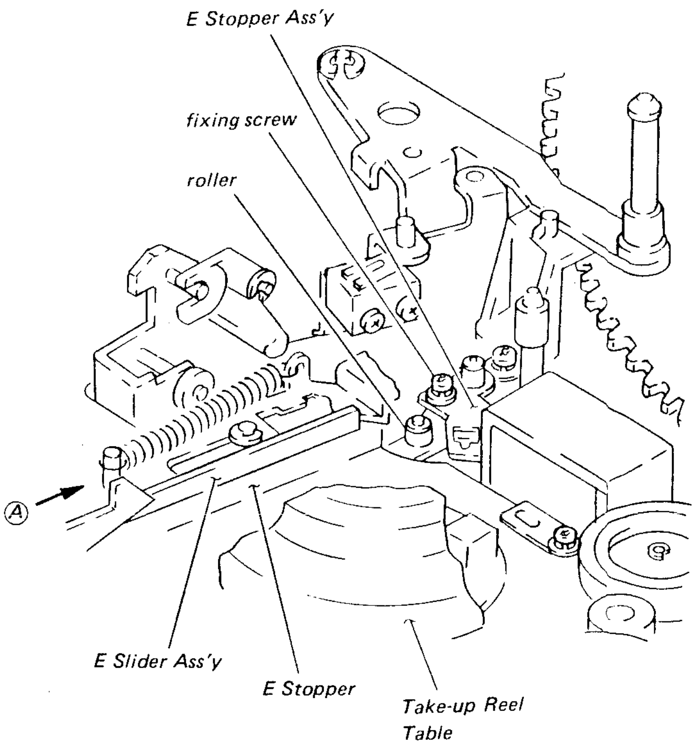
Adjustment procedure:

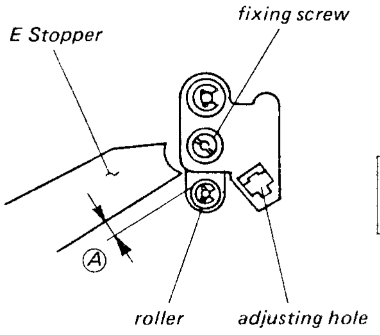
(1) Loosen the fixing screw of the E Stopper Assy about 1/2 to 1 turn.

(2) Insert a flatblade screwdriver (2mm dia.) into the adjusting hole and adjust the E Stopper Assy position so that it meets the required specification.

(3) Turn the pulley of the gear box block by hand. After advancing the Threading Ring about 10mm, tighten the fixing screw.

(4) After tightening, check again.





Spec.:
0.5 mm ≦ Ⓐ ≦ 0.8 mm

6-11. BAND HOLDER MOUNTING POSITION ADJUSTMENT

Mode: Unthreading end

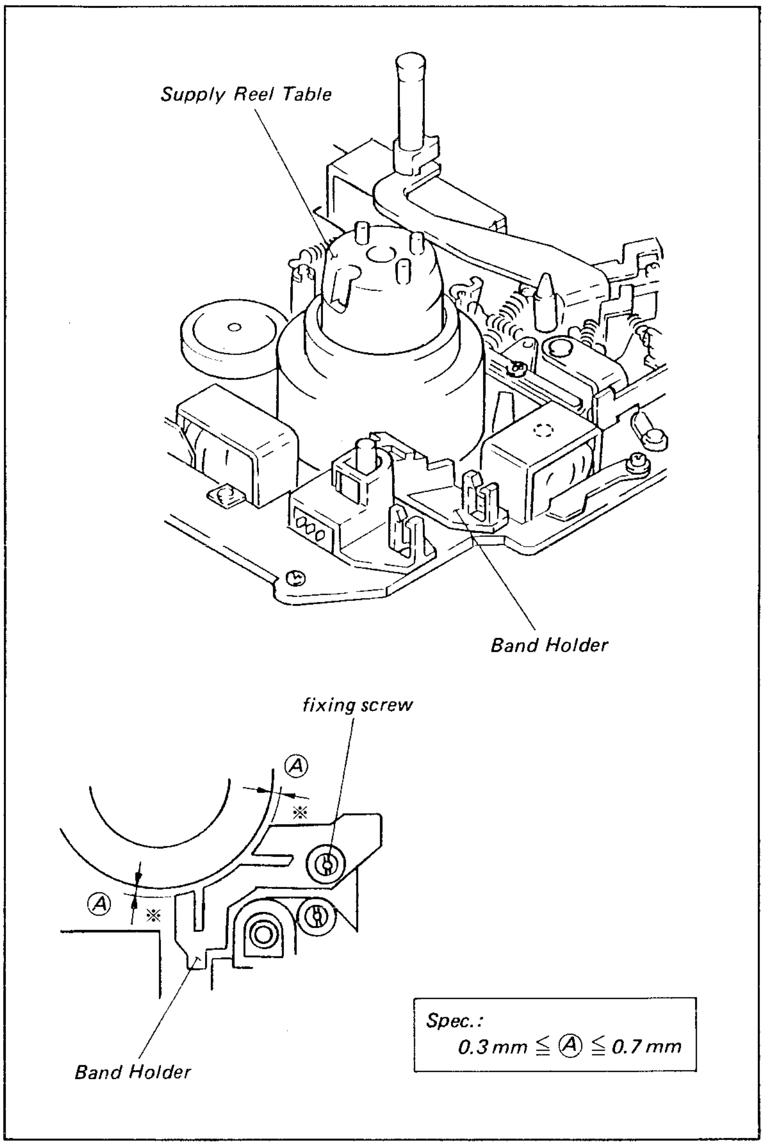
Tool: Thickness gauge

Check procedure:

(1) Check that the clearances between the ※ marked portions (two spots) of the Band Holder and the Supply Reel Table meet the required specification.

Adjustment procedure:

(1) Adjust the position of the Band Holder to meet the required specification.



Spec.:
0.3 mm ≦ Ⓐ ≦ 0.7 mm

6-12. DAMPER POSITION ADJUSTMENT OF CASSETTE-UP COMPARTMENT

. This adjustment is performed with Cassette-up Compartment removed from the unit.

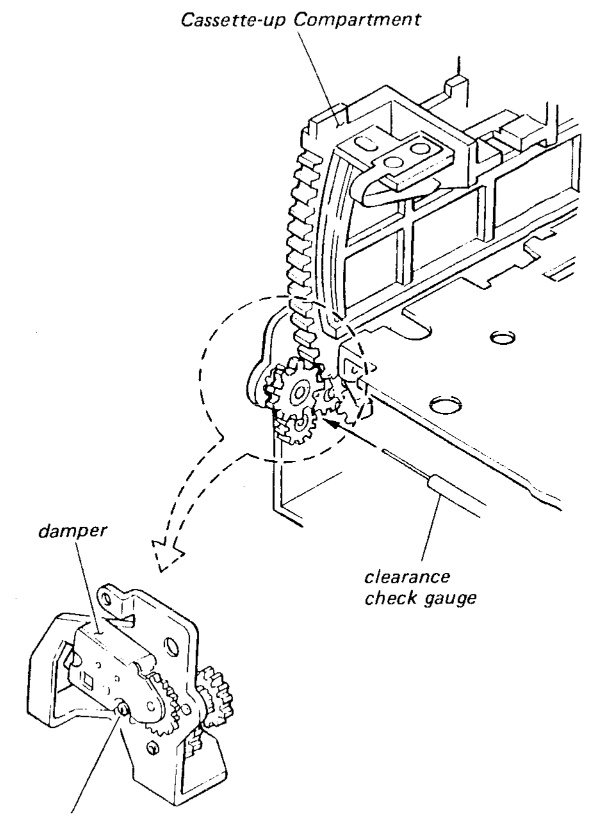
Tool: Clearance check gauge

Check procedure:

(1) Check that the clearance between the gear of the Cassette-up Compartment and the gear of the Damper Block meets the required specification.

Adjustment procedure:

(1) Adjust the position of the Damper Block to meet the required specification.



Spec.:
clearance: 0.1 mm~ 0.3 mm

6-13. CASSETTE LID OPENER BRACKET POSITION ADJUSTMENT

Mode: Unthreading end

Tool: Cassette tape

Check procedure:

(1) Release the lock of the cassette lid, and open the lid.

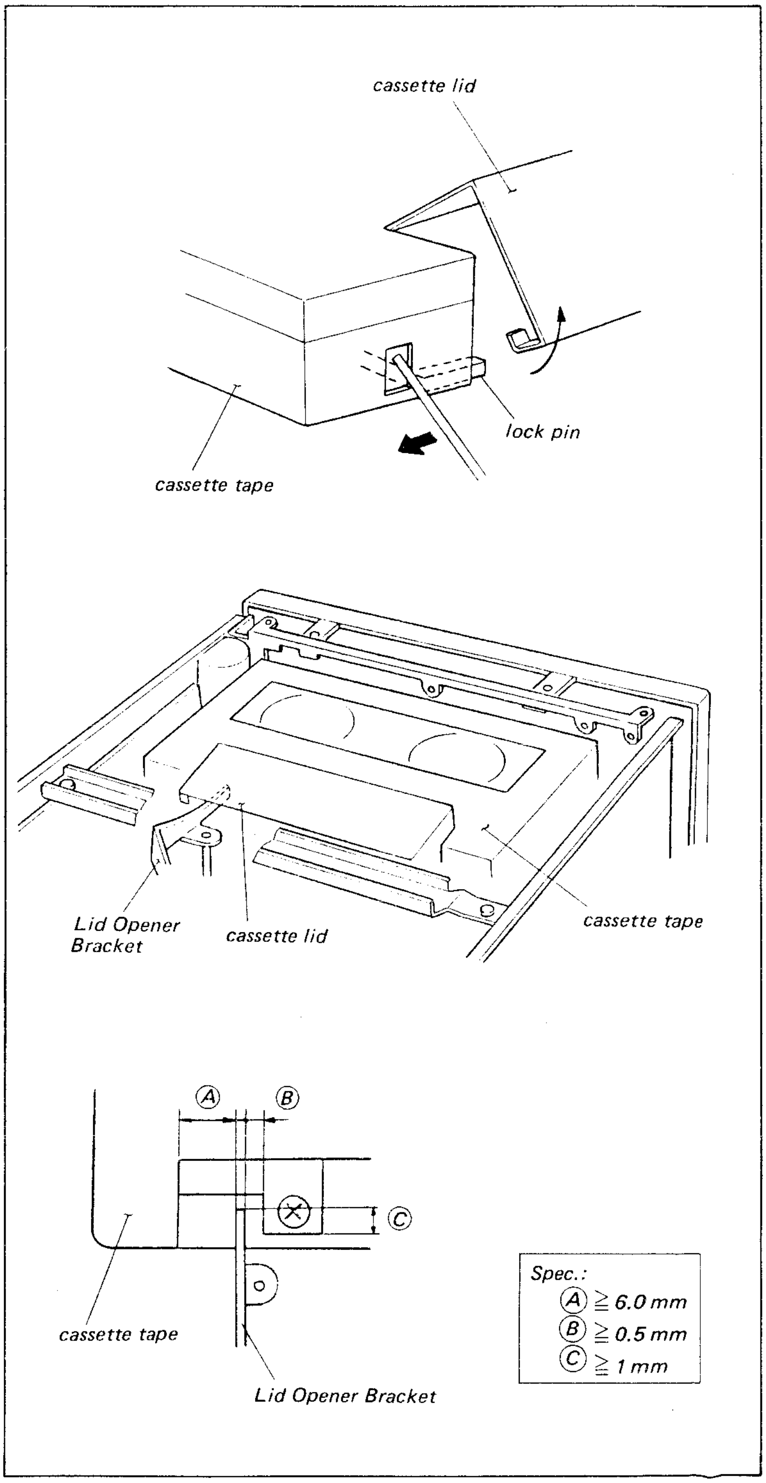
(2) Insert the cassette tape in the Cassette-up Compartment and lower the Compartment.

(3) Check that the positional relationship between the Lid Opener Bracket and the groove of the cassette tape meets the required specification.

Adjustment procedure:

(1) Adjust the mounting position of the Lid Opener Bracket to meet the required specification.

(2) If they do not meet the required specification in Step (1), bend the Lid Opener Bracket. After this adjustment, the REV Guide Slantness Adjustment must be performed.



Spec.:
Ⓐ ≧ 6.0 mm
Ⓑ ≧ 0.5 mm
Ⓒ ≧ 1 mm

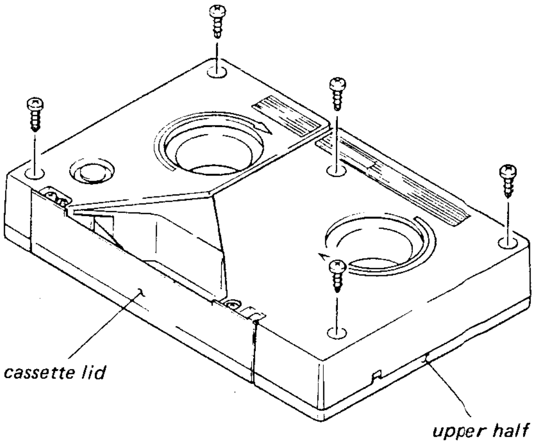
SECTION 7
TORQUE AND BACK TENSION ALIGNMENT

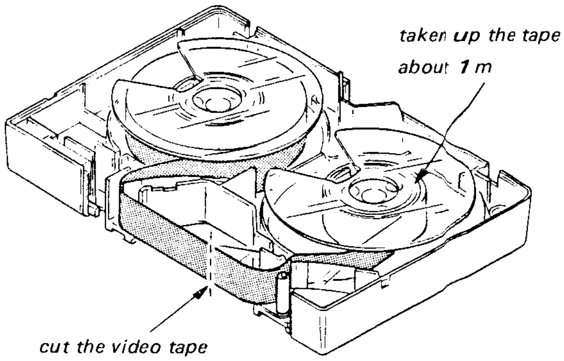
ALIGNMENT INFORMATION

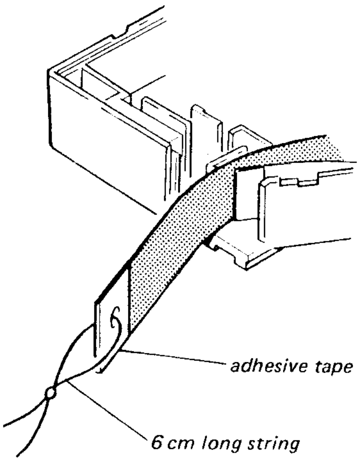
. Local specially-made Cassette Tape for the PLAY Back Tension Adjustment.

This cassette tape is used for the PLAY Back Tension Adjustment.
Prepare this tape as follows:

(1) Wind the KSP-S-20 cassette tape to the tape beginning portion.
(2) Remove the five screws on back of the cassette tape, and remove the Upper Half of the cassette.
(3) Taken up the video tape on the take-up reel about 1 meter. Cut the video tape at the position as shown in the figure. Remove the take-up reel from the cassette.
(4) Attach an adhesive tape on an end of the hole on the adhesive tape.
(5) Make a loop of 6cm long string through the hole.







7-1. SOFT BRAKE SYSTEM ADJUSTMENT

7-1-1. Take-up Soft Brake Torque Adjustment

Mode: Unthreading end

Tool: Reel table torque measurement jig (40mm dia.)
Tension scale (30g full scale)

Check procedure:

(1) Wind the tape in the clockwise direction on the reel table torque measurement jig.

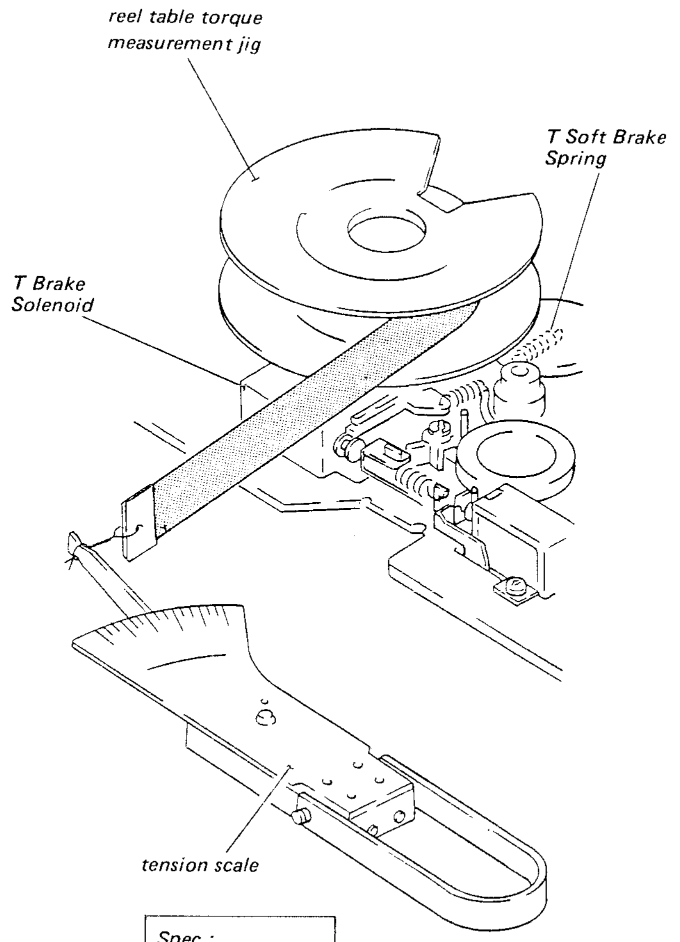
(2) Install the measurement jig on the Take-up Reel Table, and hook a tension scale on the end of the tape.

(3) Push the plunger of the T Brake Solenoid in as far as possible by hand.
(Hold it in place, the fully engaged position.)

(4) In the fully engaged position, pull the tension scale at a constant speed of approx. 10cm/sec. in the direction of the arrow, as shown in figure. Check that the scale reading meets the required specification.

Adjustment procedure:

(1) Replace the T Soft Brake, or adjust it by straightening or cutting off the spring of the Soft Brake.



Spec.:
5~15g
(10~30g.cm)

7-1-2. S Soft Brake Torque Adjustment

Mode: Unthreading end

Tool: Reel table torque measurement jig (40mm dia.)
Tension scale (30g full scale)

Check procedure:

(1) Push down the Cassette-in Switch Pin, and insert the paper between the Pin and the Holder so that the Pin does not rise up.

(2) Wind the tape in the clockwise direction on the reel table torque measurement jig.

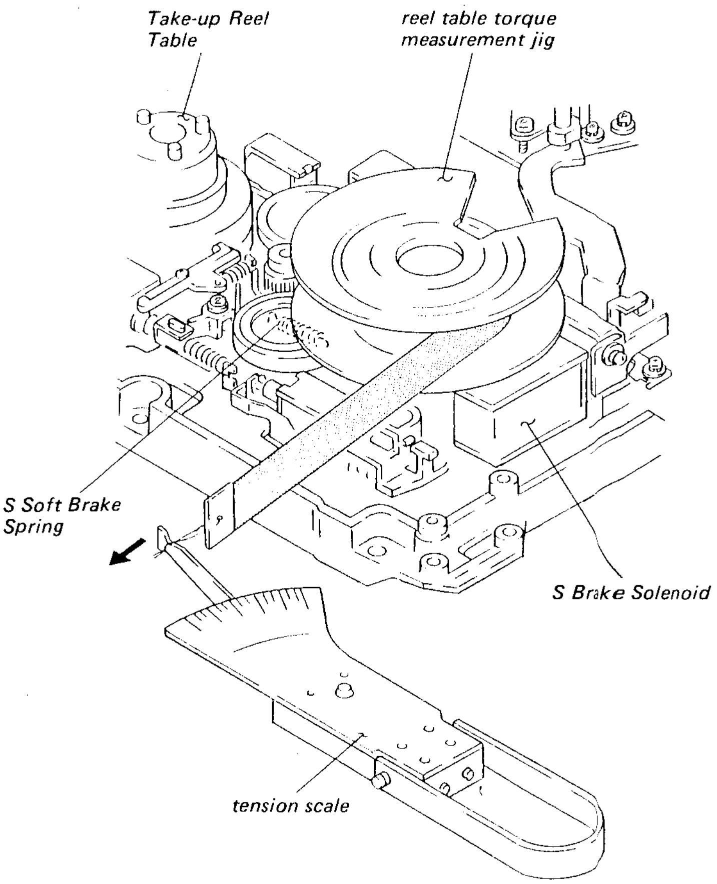
(3) Install the measurement jig on the Supply Reel Table, and hook a tension scale on the end of the tape. Check that the Reel Hub does not contact with the paper that is inserted into Step (1).

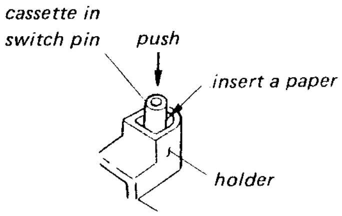
(4) Push the plunger of the S Brake Solenoid in as far as possible by hand. (Hold it in place, the fully engaged position.)

(5) In the fully engaged position, pull the tension scale at a constant speed of approx. 10cm/sec. in the direction of the arrow, as shown in figure. Check that the scale reading meets the required specification.

Adjustment procedure:

(1) Replace the S Soft Brake, or adjust it by straightening or cutting off the spring of the Soft Brake.





Spec.:
15~25g
(30~50g.cm)

7-2. MAIN BRAKE SYSTEM ADJUSTMENT

7-2-1. Take-up Main Brake Torque Adjustment

Mode: Unthreading end

Tool: Reel table torque measurement jig (40mm dia.)

Tension scale (500g full scale)

Check procedure:

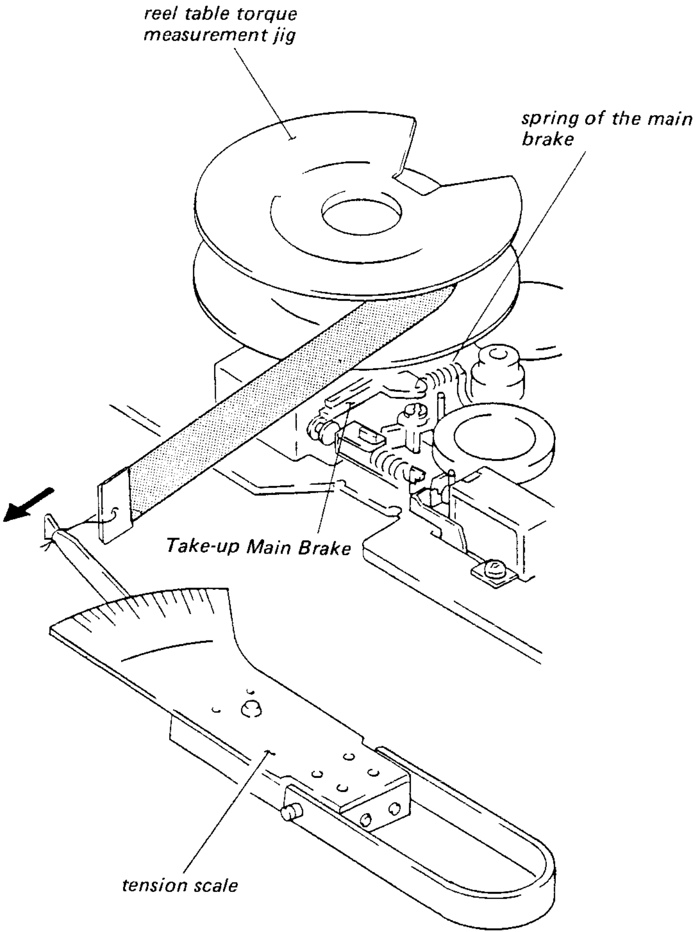
(1) Wind the tape in the clockwise direction on the reel table torque measurement jig.

(2) Install the measurement jig on the Take-up Reel Table, and hook a tension scale on the end of the tape.

(3) Pull the tape at a constant speed of approx. 10cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification.

Adjustment procedure:

(1) Replace the Take-up Main Brake, or adjust it by straightening or cutting off the spring of the Main Brake.



Spec.:
140~210g
(280~420g.cm)

7-2-2. Supply Main Brake Torque Adjustment

Mode: Unthreading end

Tool: Reel table torque measurement jig (40mm dia.)
Tension scale (500g full scale)

Check procedure:

(1) Push down the Cassette-in Switch Pin, and insert the paper between the Pin and the Holder so that the Pin does not rise up.

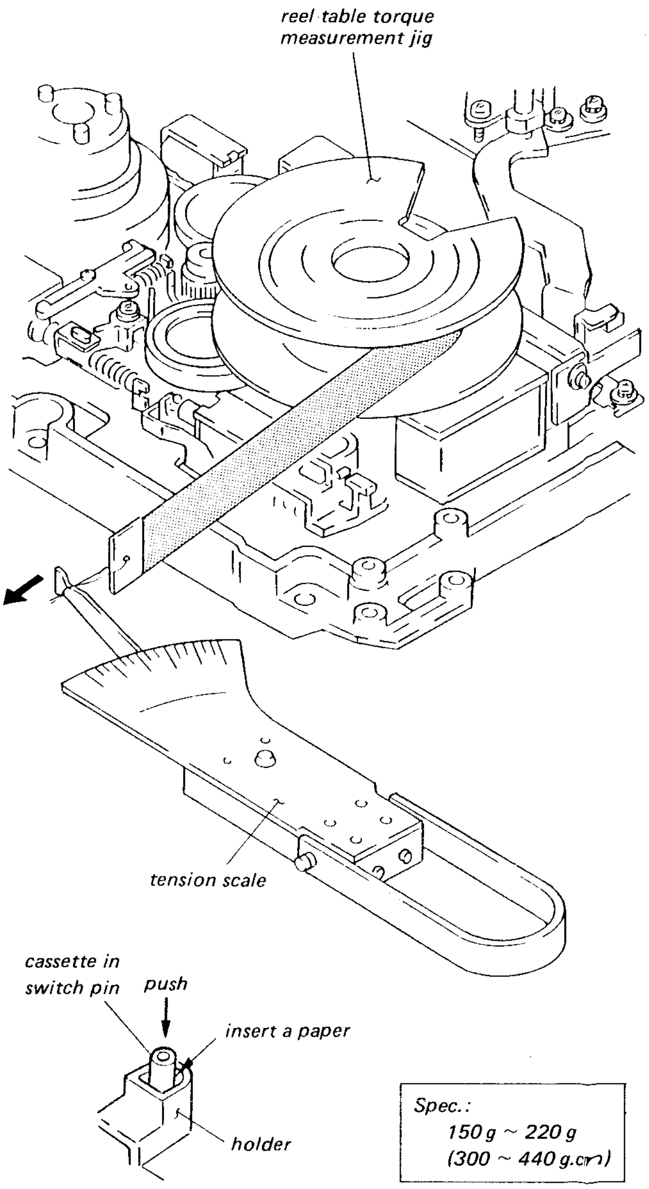
(2) Wind the tape on the reel table torque measurement jig in the clockwise direction.

(3) Install the measurement jig on the Supply Reel Table, and hook a tension scale on the end of the tape. Check that the Reel Hub does not contact with the paper that is inserted into Step (1).

(4) Pull the tape at a constant speed of approx. 10cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification.

Adjustment precedure:

(1) Replace the Supply Main Brake, or adjust it by straightening or cutting off the spring of the main brake.



Spec.:
150 g ~ 220 g
(300 ~ 440 g.cm)

7-3. PLAY BACK TENSION ADJUSTMENT

Mode: Threading end

Tool: Local specially-made cassette tape for the PLAY Back Tension Adjustment. (Refer to the alignment information.)
Tension scale (100g full scale)

Preparation:

(1) Open the SV-57C Board.

(2) Short between TP6/SY-22A Board and GND (frame) with a short clip lead. (Stop the function of the Tape Slack Detection Circuit)

(3) Place the local specially-made cassette tape, and thread the tape as shown in the figure.

(4) Hook the tension scale on the end of the tape.

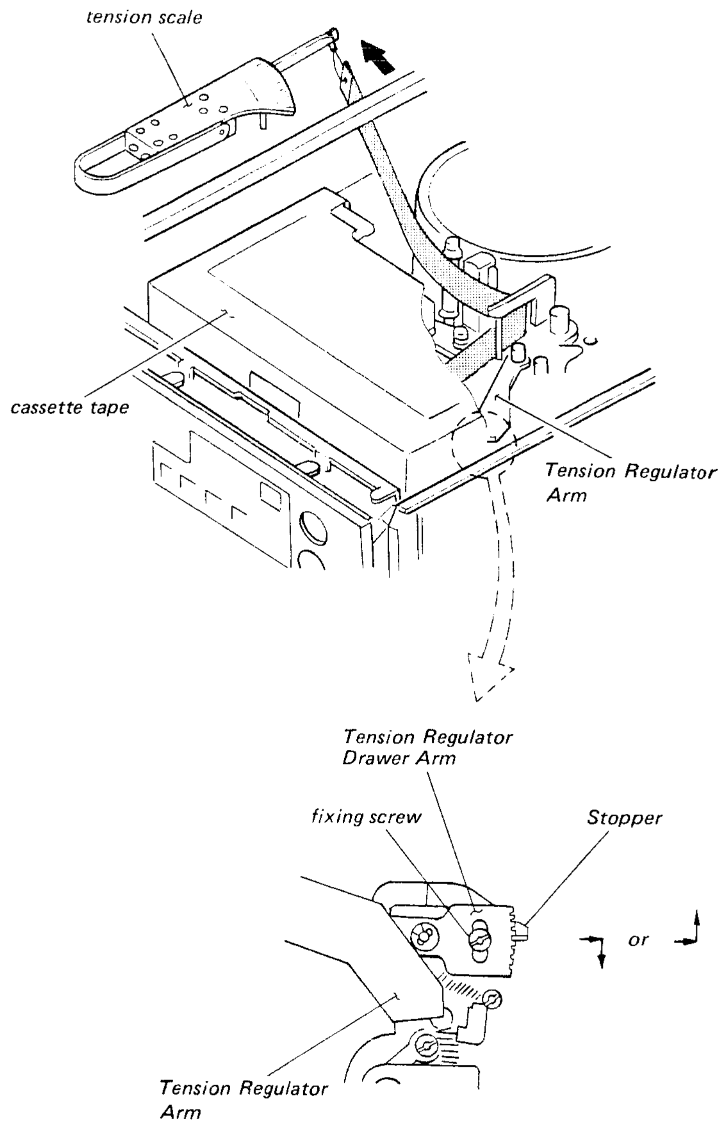
Check procedure:

(1) Put the machine into the PLAY mode.

(2) Pull the tape at a constant speed of approx. 9cm/sec in the direction shown in the figure, and check that the scale reading meets the required specification.

Adjustment procedure:

(1) Adjust the position of the stopper in the direction of the arrow so that it meets the required specification.



Spec.:
75~80g

SECTION 8
TAPE RUN ALIGNMENT

8-1. S-TENSION REGULATOR ARM SLANT ADJUSTMENT

Mode: Threading end (POWER OFF)

Tool: Reel table height check base jig
Tape guide slantness check tool

Check procedure:

(1) Put the reel table height check base jig in the cassette's position.

(2) Push and lock the EJECT button.

(3) Turn the pulley of the gear box by hand so that the Tape Guide Roller of the S Tension Regulator Arm is to the right of TG-1.

(4) Place the tape guide slantness check tool against the Tape Guide Roller from directions A and B, as shown in the figure. Check that the slant of the guide roller meets the required specification.

Adjustment procedure:

(1) Loosen the fixing screw about 1 turn.

. When the slant is out of spec. while pressing from direction A,

(2) If there is clearance at the top portion, turn the adjusting screw (A) in the clockwise direction so that it meets the specification.

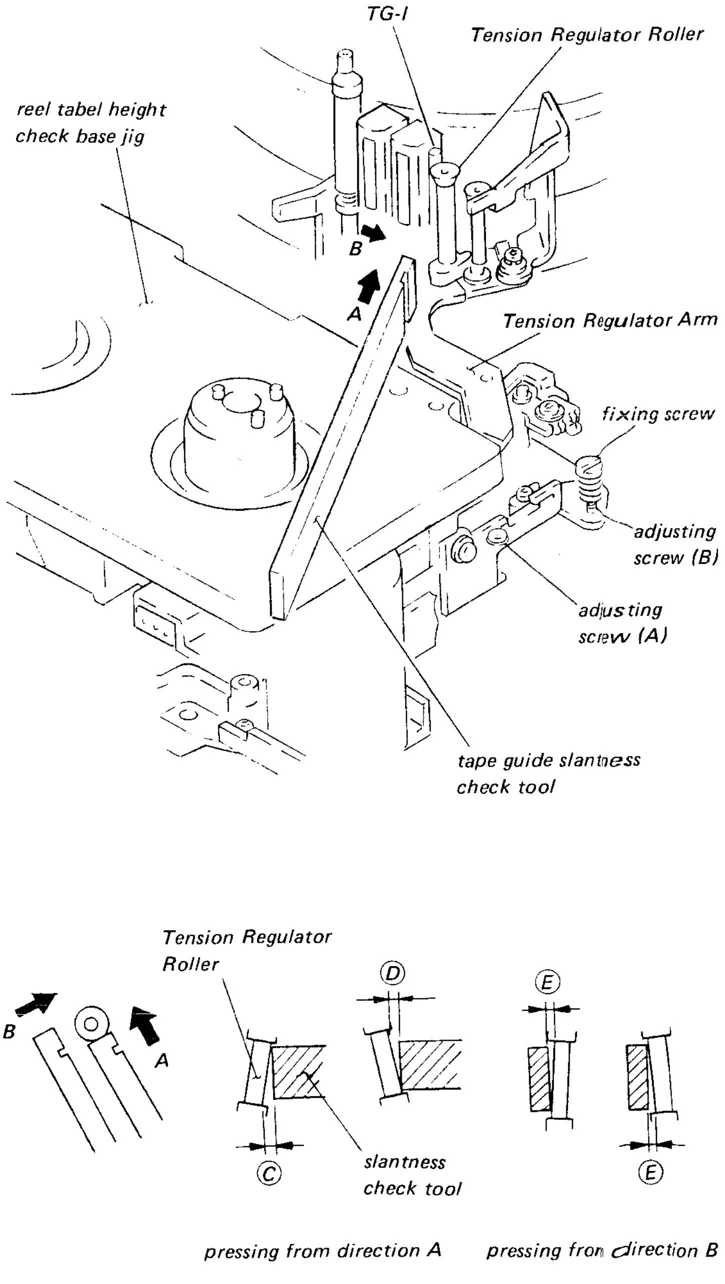
(3) If there is clearance at the bottom portion, turn the adjusting screw (B) in the counterclockwise direction so that it meets the specification.

. When the slant is out of spec. while pressing from direction B,

(4) If there is clearance at the top portion, turn the adjusting screw (B) in the clockwise direction so that it meets the specification.

(5) If there is clearance at the bottom portion, turn the adjusting screw (A) in the counterclockwise direction so that it meets the specification.

(6) Tighten the fixing screw, and check again.



Spec.:
Ⓓ : There is no clearance.
0.05 mm ≦ Ⓒ ≦ 0.15 mm
Ⓔ ≦ 0.1 mm

8-2. REV GUIDE SLANT ADJUSTMENT

Mode: Unthreading end

Tool: Reel table height check base jig
Tape guide slantness check tool

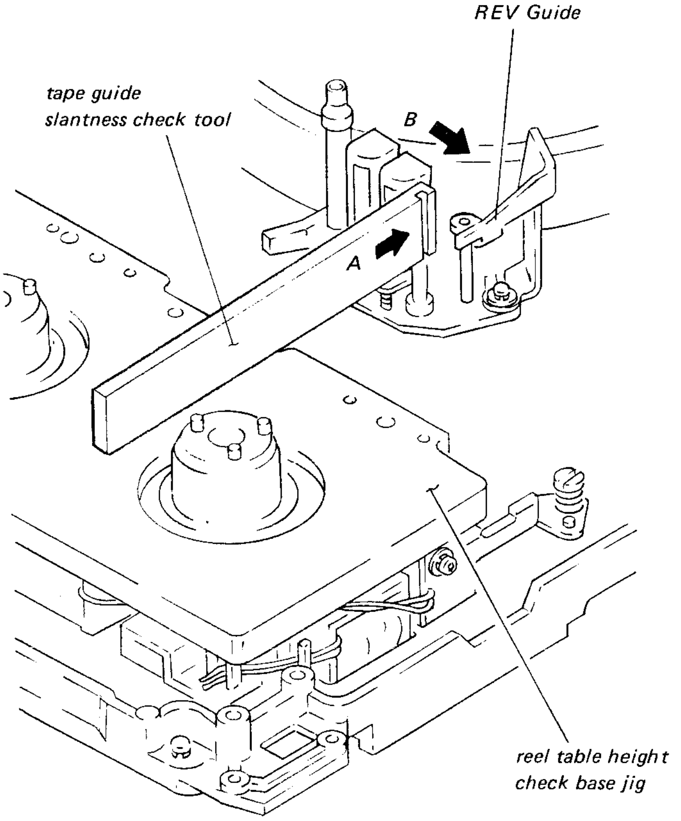
Check procedure:

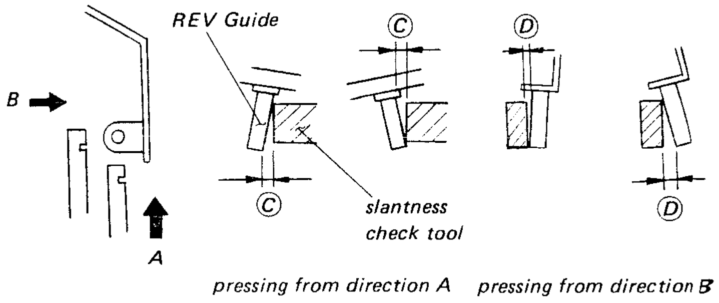
(1) Place the reel table height check base jig in the cassette's position.

(2) Place the tape guide slantness check tool against the REV Guide, as shown in the figure. Check that the slant meets the required specification.

Adjustment procedure:

(1) Push the lower side of the REV Guide by hand until it meets the required specifications.


REV Guide
tape guide slantness check tool
B
A
reel table height check base jig



Spec.:
Ⓒ ≦ 0.5 mm
Ⓓ ≦ 0.2 mm

8-3. TU ARM SLANT ADJUSTMENT

Mode: Threading end

Tool: Reel table height check base jig
Tape guide slantness check tool

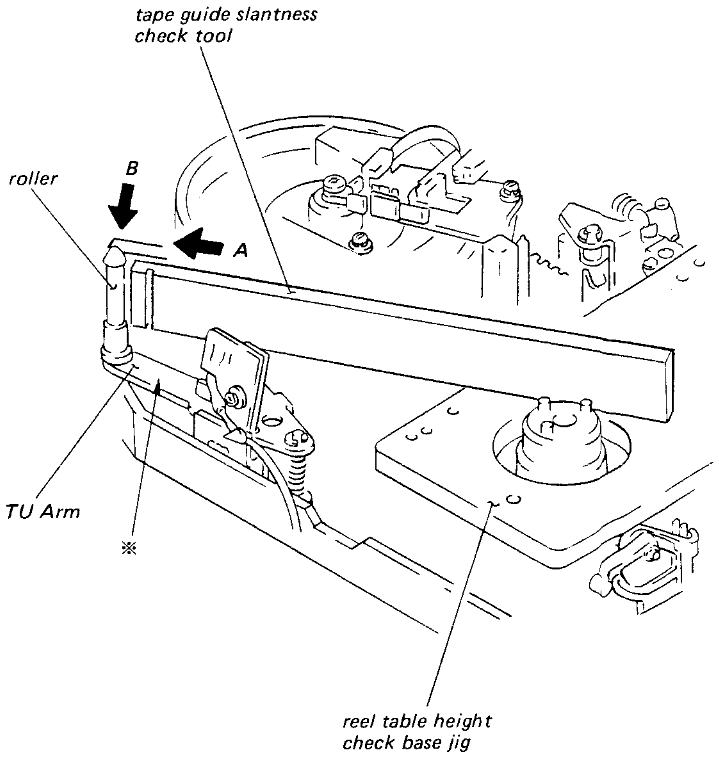
Check procedure:

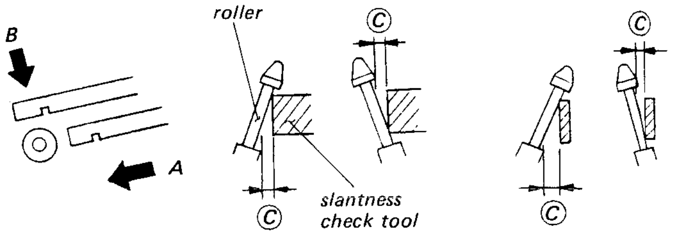
(1) Place the reel table height check base jig in the cassette's position.

(2) Place the tape guide slantness check tool against the roller of the TU Arm as shown in the figure. Check that the slant meets the required specification.

Adjustment procedure:

(1) Bend the ※ marked portion of the TU Arm so that it meets the required specification.


tape guide slantness check tool
roller
B
A
TU Arm
※
reel table height check base jig



pressing from direction A *pressing from direction B*

Spec.:
© ≦ 0.3 mm

8-4. TU ARM ROLLER GUIDE HEIGHT ADJUSTMENT

Mode: PLAY and F.FWD

Tool: Cassette tape, KCS-20 or equivalent

Check procedure:

(1) Insert the cassette tape and put the machine into the PLAY mode.

(2) Check that the tape runs in the middle of the cassette's Take-up Guide.

(3) Check that the tape runs in contact with the upper flange of the TU Arm.

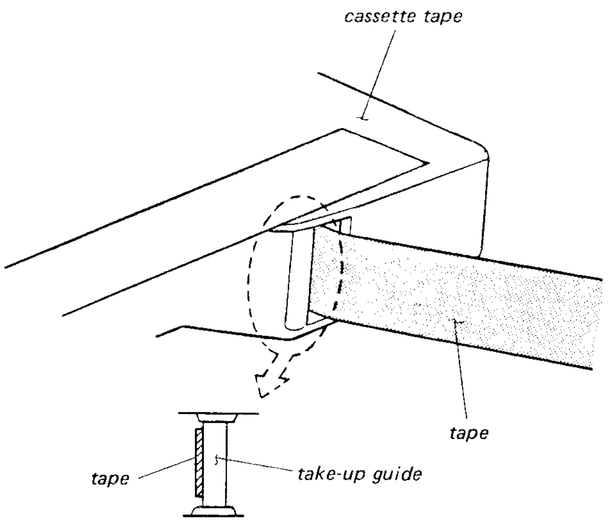
(4) Put the machine into the F.FWD mode.

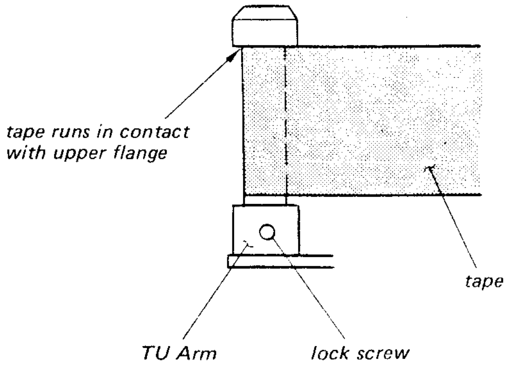
(5) Check in the same manner as Steps (2) and (3).

Adjustment procedure:

(1) Loosen the locking screw.

(2) Turn the upper flange of the tape guide to meet the required specification.





8-5. ERASE HEAD ZENITH ADJUSTMENT

Mode: Threading end

Tool: Reel table height check base jig
Tape guide slantness check tool

Check procedure:

(1) Install the reel table height check base jig in the cassette's position.

(2) Place the tape guide slantness check tool against the erase head, as shown in the figure. Check that the zenith meets the required specification.

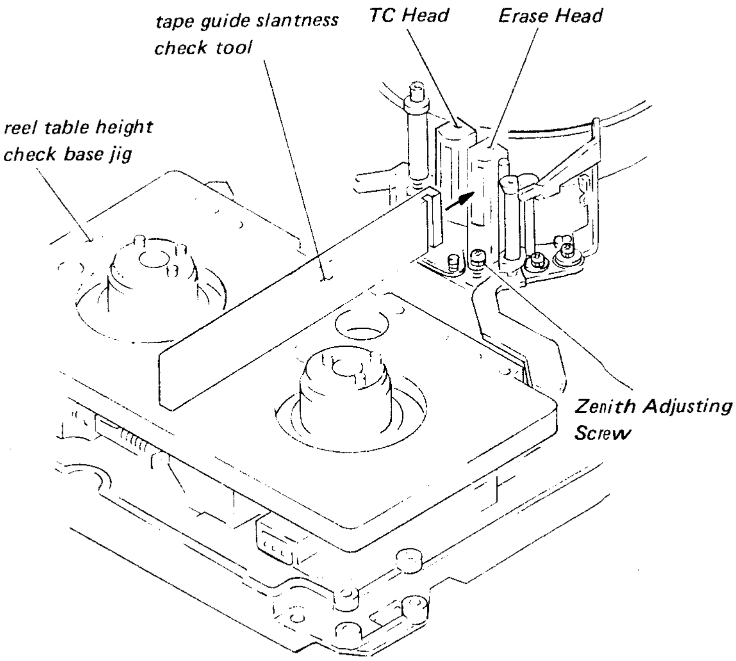
Adjustment procedure:

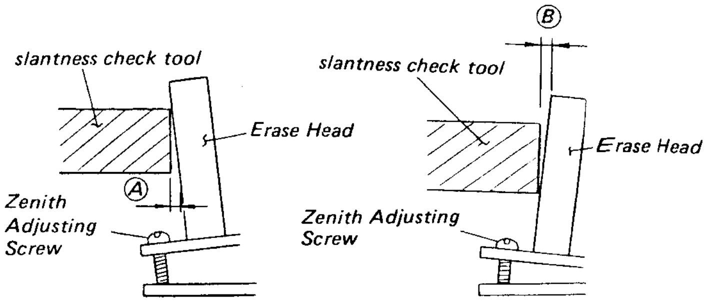
. When the clearance at the bottom portion is out of spec.,

(1) Turn the Zenith Adjusting Screw in the counterclockwise direction to meet the required specification.

. When the clearance at the top portion is out of spec.,

(2) Turn the Zenith Adjusting Screw in the clockwise direction to meet the required specification.


tape guide slantness check tool
TC Head
Erase Head
reel table height check base jig
Zenith Adjusting Screw



Spec.:
Ⓐ : There is no clearance.
Ⓑ $\leqq$ 0.05 mm

8-6. VIDEO TRACKING ADJUSTMENT

Mode: Playback the alignment tape

Tool: Alignment tape, RR2-1SD PAL
Oscilloscope
Allen wrench (across flat has 1.27mm)
Small mirror for adjustment

Preparation:

(1) Remove the Rear Panel and Lower Case.

(2) Connect the oscilloscope as follows:
CH-1 : RF OUT connector on the connector panel
CH-2 : TP2/IF-99 on VO-12 Board
EXT.TRIG : TP2/IF-99
GND : E2/IF-99

(3) Short between TP4 and TP3 on the IF-99 Board with a short clip lead.
(The other channel can observe by shorting between TP4 and E3 with a short clip lead.)

(4) Short between TP3 and GND on the SV-57C Board with a short clip lead.

(5) Playback the alignment tape.

Check procedure:

(1) While turning the TRACKING control knob, check that the RF envelope maintains a flat envelope as it increases and decreases.

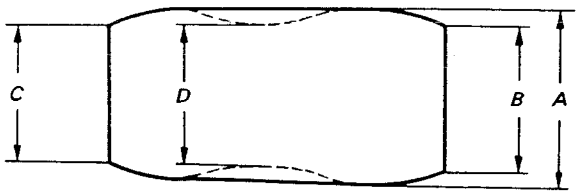
(2) Check that the RF envelope fluctuation and the head-to-tape contact are within the specification at the center detent position of the TRACKING control knob in FWD, REW and FF modes.

(3) Check that there is not any tape curl at the Tension Regulator, TG-I, TG-II, TG-III and TG-IV.

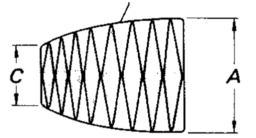
(4) Put the machine into the PAUSE mode, and check that the RF envelope is not lacking.

(5) Put the machine into the F.FWD and REW modes, and check the tape curl of each tape guides are within the specification.

FWD mode

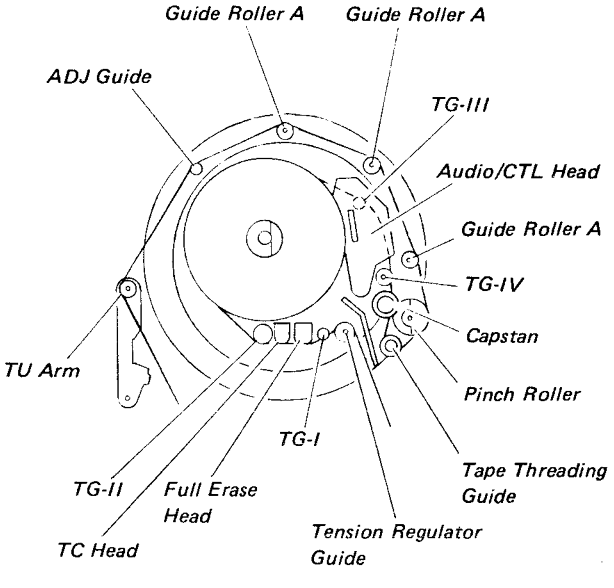


REW, FF mode



Spec.:

• *FWD mode*	• *REW·FF mode*
head-to-tape contact	*head-to-tape contact*
$\frac{C}{A} \geqq 0.7$	$\frac{C}{A} \geqq 0.6$
$\frac{B}{A} \geqq 0.7$	
fluctuation	
$\frac{D}{A} \geqq 0.9$	



Adjustment procedure:

. When adjusting the tape guide height,
Loosen the set screw of each tape guide, and adjust the height by turning the upper flange or adjusting the screw.

. When the tracking at the drum entrance is not correct,

(1) Turn the TRACKING control knob so that the RF envelope amplitude is 70 to 80 % of the maximum amplitude.

(2) Turn the upper flange of TG-II so that the upper flange does not contact the upper edge of the tape.

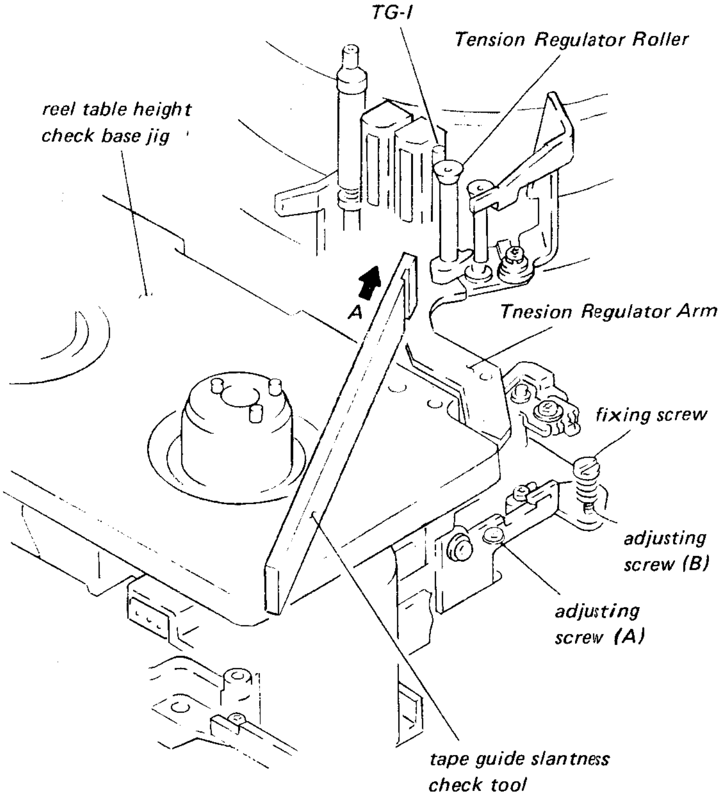
(3) Adjust the height of the Tension Regulator by turning the upper flange to meet the following specifications:

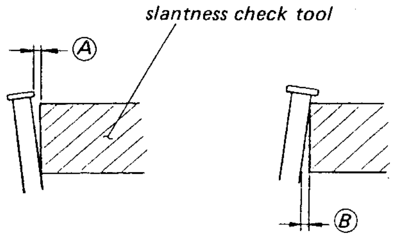
- . The tape runs in contact with the upper flange.
- . The tape runs in contact with the lead of the head drum.
- . The RF envelope waveform is flat.

(4) Adjust the height of TG-I by turning the adjusting screw so that the tape runs in contact with the lower flange of TG-I. Turn the adjusting screw 1/4 turn in the clockwise direction from the above state so that there is clearance between the tape and the lower flange. Tighten the lock screw.

(5) Adjust the height of TG-II by turning the upper flange so that the upper edge of the tape runs in contact with the upper flange.

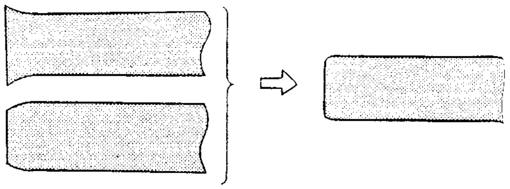
(6) If the specification for the RF envelope fluctuation or the head-to-tape contact at the drum entrance is not met, adjust the slant of the Tension Regulator to be within the range of the specification by turning the adjusting screw, as shown in the figure. Perform the Steps (1) to (5) again.





Spec.:
Ⓐ : There is no clearance.
Ⓑ ≦ 0.1 mm

<drum entrance side>



- When the tracking at the drum exit is not correct,

(7) Turn the TRACKING control knob so that the RF envelope amplitude is 70 to 80 % of the maximum amplitude.

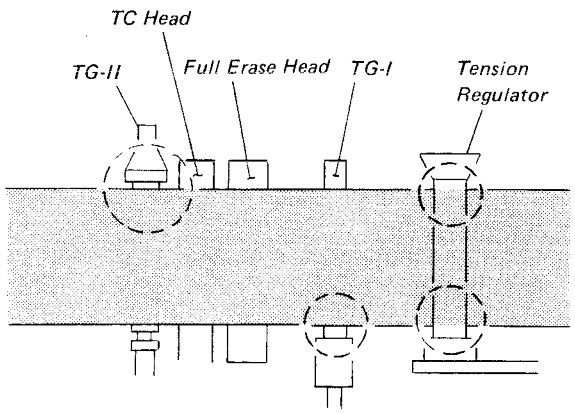
(8) Turn the upper flange of TG-III so that the upper flange does not contact the upper edge of the tape.

(9) Adjust the height of TG-IV by turning the upper flange to meet the following specifications:

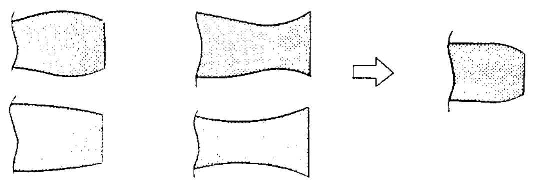
  - The tape runs in contact with the lead of the head drum.
  - The tape runs in contact with the upper flange of TG-IV.
  - The RF envelope waveform is flat.

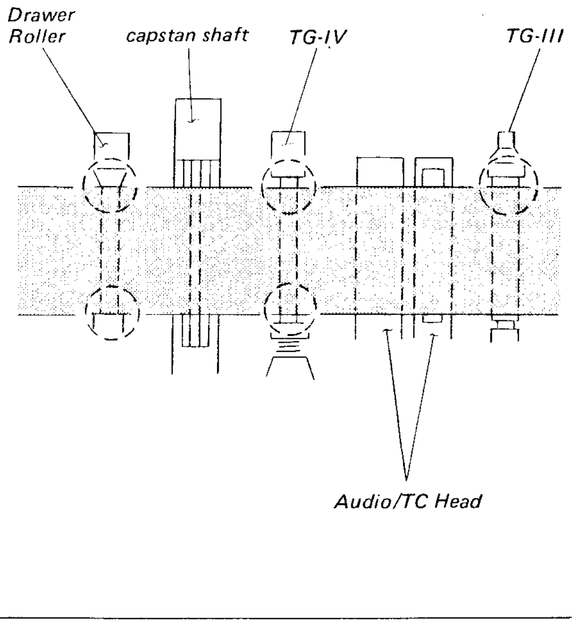
(10) Adjust the height of TG-III by turning the upper flange so that the upper edge of the tape runs in contact with the upper flange.

(11) If the specification of the RF envelope fluctuation or the head-to-tape contact at the drum exit is not met, adjust the slant to be within the range of the specification. (Refer to sec.8-7. Audio/CTL Head Zenith Adjustment.)
Perform Steps (7) to (10) again.



<drum exit side>





8-7. AUDIO/CTL HEAD ZENITH ADJUSTMENT

Mode: Turn the pulley of the gear box block by hand so that the guide on the Threading Ring is not located in front of the Audio/CTL Head.

Tool: Flatness plate

Check procedure:

(1) Place the flantness plate against the TG-III tape guide, as shown in the figure.

(2) Check that the clearance between the head and the flatness plate meets the required specification, when the flatness plate is set on the flat portion of TG-III and the CTL Head.

Adjustment procedure:

. If there is a clearance at the bottom portion,

(1) Loosen the fixing screw 1/4 to 1/2 turn.

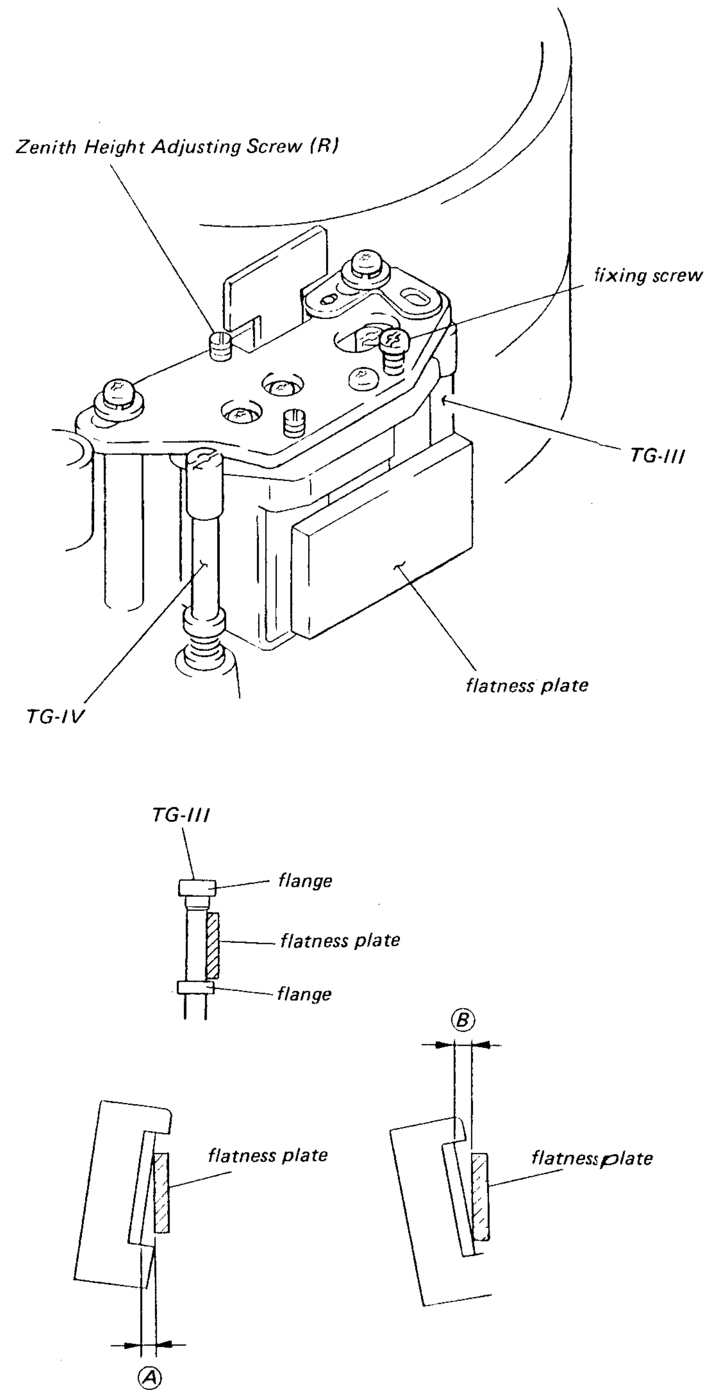
(2) Turn the Zenith Height Adjusting Screw (R) in the clockwise direction and adjust the zenith.

(3) Tighten the fixing screw and check again.

. If the clearance at the top portion is out of the required specification,

(4) Turn the Zenith Height Adjusting Screw (R) in the counterclockwise direction and adjust the zenith.

(5) Tighten the fixing screw and check again.



Spec.:
Ⓐ : There is no clearance.
Ⓑ ≦ 0.05 mm

8-8. AUDIO HEAD HEIGHT ADJUSTMENT

Mode: Playback the alignment tape

Tool: Alignment tape, RR5-1SD PAL
Dual trace oscilloscope or VTVM

Preparation:

(1) Connect the oscilloscope or VTVM to AUDIO OUT CH-1 and CH-2.

(2) Playback the audio 1kHz signal portion of the alignment tape.

Check procedure:

(1) While pressing down on the tape at (a), check that the level decreases.

(2) While pushing up on the tape at (b), check that the level decreases.

Adjustment procedure:

. If the level increases while pressing down on the tape at (a),

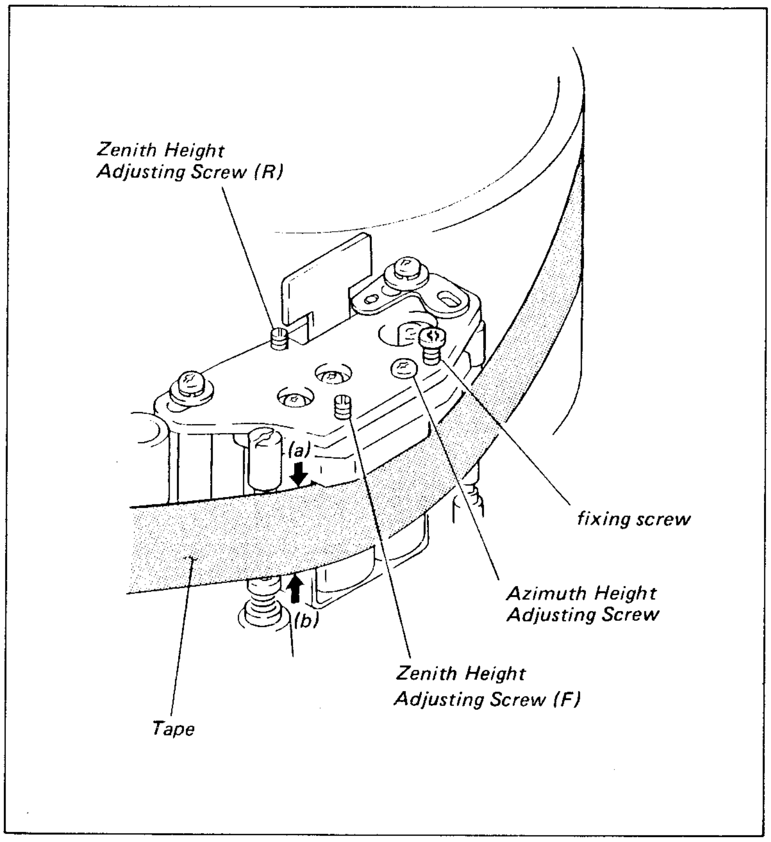
(1) Loosen the fixing screw 2 to 3 turns. Turn the Zenith Height Adjusting Screws (R) and (F) in the counterclockwise direction and turn the Azimuth Height Adjusting Screw an exactly equal amount in the clockwise direction. Adjust for maximum output.

(2) After the adjustment, tighten the fixing screw and check again.

. If the level increases while pushing up on the tape at (b),

(3) Turn the Zenith Height Adjusting Screws (R) and (F) in the clockwise direction and turn the Azimuth Height Adjusting Screw an exactly equal amount in the counterclockwise direction. Adjust for maximum output.

(4) After the adjustment, tighten the fixing screw and check again.


Zenith Height Adjusting Screw (R)
(a)
(b)
fixing screw
Azimuth Height Adjusting Screw
Zenith Height Adjusting Screw (F)
Tape

8-9. AUDIO HEAD PHASE ADJUSTMENT

Mode: Playback the alignment tape

Tool: Alignment tape, RR5-1SD PAL
Dual trace oscilloscope

Preparation:

(1) Connect the HORIZONTAL and VERTICAL terminals of the oscilloscope to AUDIO OUT CH-1 and CH-2.

(2) Playback the audio 10kHz signal portion of the alignment tape.

(3) Adjust the scope for a lissajous waveform with horizontal and vertical amplitudes of 6cm.

Check procedure:

(1) Check that the vertical amplitude of the signal at X=0 meets the required specification.

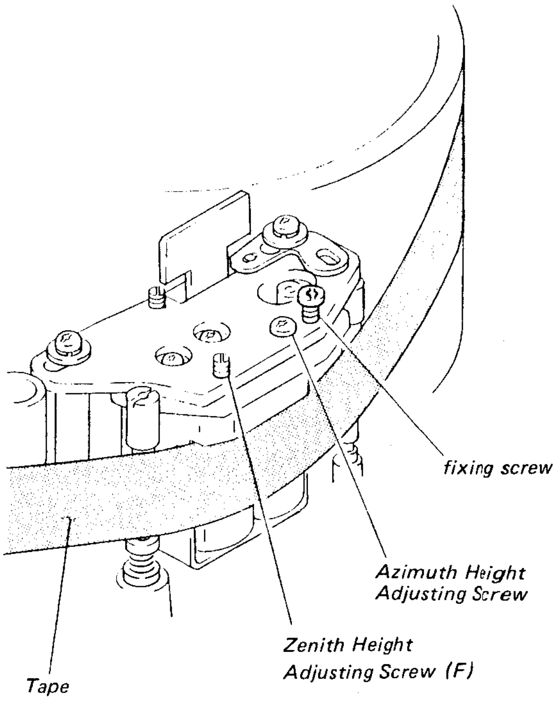
(2) Playback the audio 1kHz signal portion of the alignment tape, and check that the lissajous waveform meets the required specification.

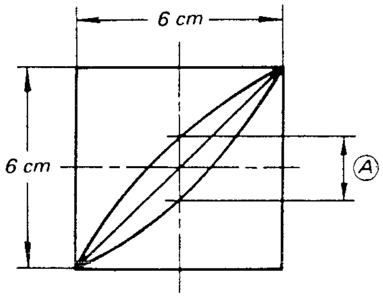
Adjustment procedure:

(1) Loosen the fixing screw about 1/4 to 1/2 turn.

(2) Turn the Azimuth Height Adjusting Screw to meet the required specification.

(3) Tighten the fixing screw, and check the phase again.


fixing screw
Azimuth Height Adjusting Screw
Zenith Height Adjusting Screw (F)
Tape



Spec.:
10 kHz: Ⓐ ≦ 1.5 cm
1 kHz: Ⓐ ≦ 0.52 cm

8-10. CTL HEAD POSITION ADJUSTMENT

Mode: Playback the alignment tape

Tool: Alignment tape, RR5-1SD PAL
Oscilloscope
Eccentric screwdriver (4mm dia.)

Preparation:

(1) Remove the Rear Panel and Lower Case.

(2) Connect the oscilloscope as follows:
CH-1 : RF OUT connector on the connector panel
EXT.TRIG : TP2/IF-99 on VO-12 Board
GND : E2/IF-99

(3) Short between TP3 and GND on the SV-57C Board with a short clip lead.

(4) Playback the alignment tape.

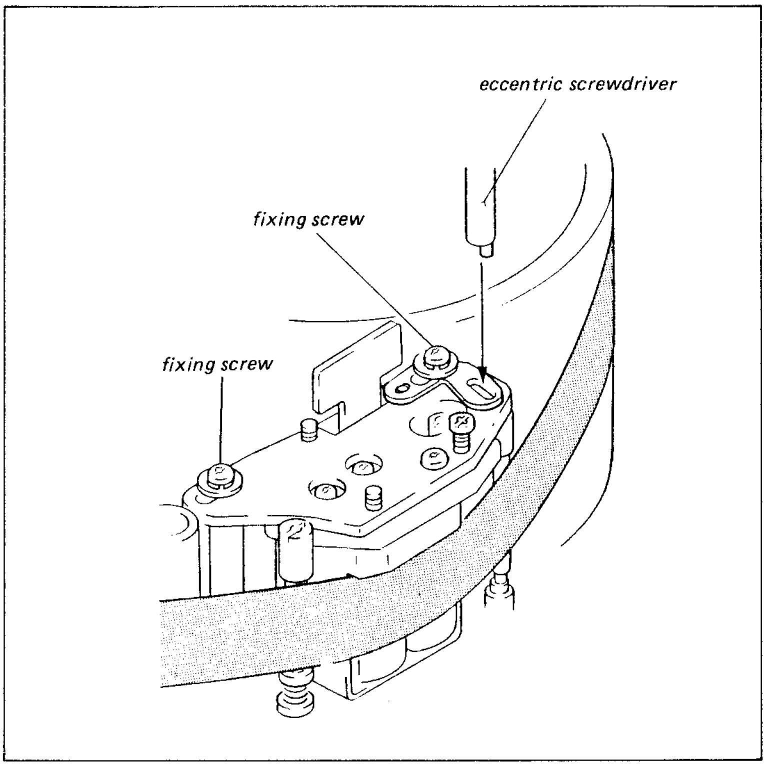
Check procedure:

(1) While turning the TRACKING control knob, check that the RF envelope has the maximum amplitude at the center detect position.

Adjustment procedure:

(1) Loosen the two fixing screws about 1/4 to 1/2 turn.

(2) Insert the eccentric screwdriver into the hole, as shown in the figure. Adjust the CTL head position to meet the required specification.



8-11. TC HEAD ZENITH ADJUSTMENT

Mode: Unthreading-end

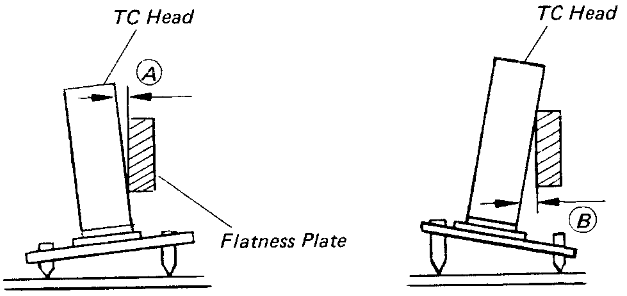
Tool: Flatness plate

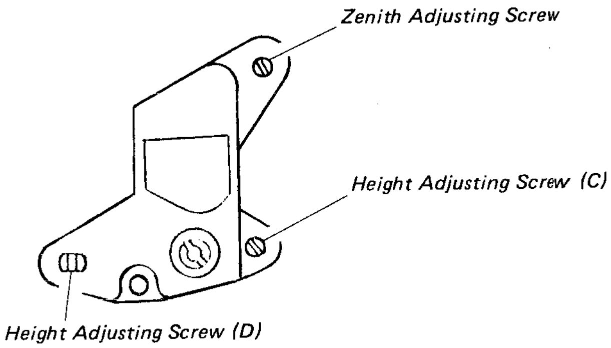
Check procedure:

(1) Check that the clearance between the TC Head and the Flatness Plate meets the required specification, when the Flatness Plate is set on the TG-III and the TC Head.

Adjustment procedure:

(1) Turn the Zenith Adjusting Screw to meet the required specification.





Spec.:
0 mm ≦ Ⓐ ≦ 0.05 mm
Ⓑ: There is no clearance.

8-12. TC HEAD HEIGHT ADJUSTMENT

Mode: Playback the alignment tape

Tool: Alignment tape, RR5-1SD PAL
Oscilloscope

Preparation:

(1) Connect the oscilloscope to TIME CODE OUT terminal.

(2) Playback the time code signal recorded segment of the alignment tape.

Check procedure:

(1) While pressing down on the tape at (a), check that the level decreases.

(2) While pushing up on the tape at (b), check that the level decreases.

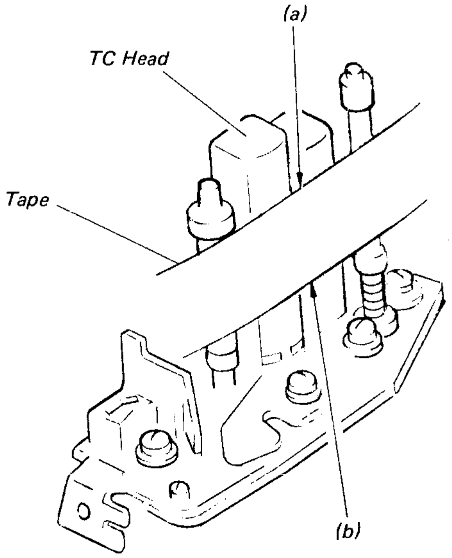
Adjustment procedure:

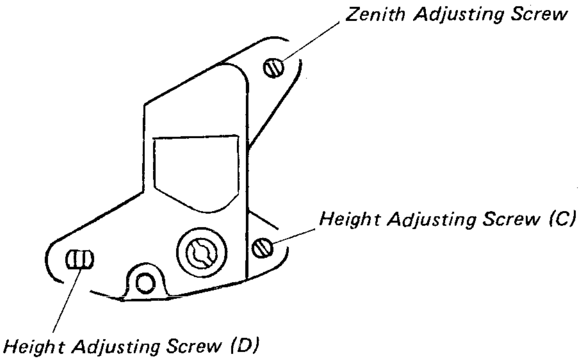
. If the level increases while pressing down on the tape at (a),

(1) Turn the Height Adjusting Screws (C) and (D), and Zenith Adjusting Screw an exactly equal amount in the clockwize direction.

. If the level increases while pushing up on the tape (b),

(2) Turn the Height Adjusting Screws (C) and (D), and Zenith Adjusting Screw an exactly equal amount in the counter-clockwise direction.





8-13. TC HEAD POSITION ADJUSTMENT

Mode: Playback the alignment tape

Tool: Dual trace oscilloscope
Alignment tape, RR5-1SD PAL
Eccentric screwdriver (4mm dia.)

Preparation:

(1) Connect the oscilloscope as follows:
CH-1 : TIME CODE OUT connector
CH-2 : TP4/SV-57C Board
EXT.TRIG : TP4/SV-57C Board

(2) Playback the time code signal recorded segment of the alignment tape.

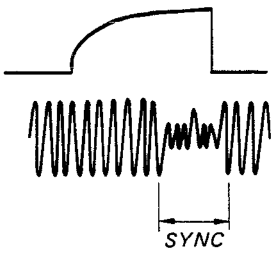
Check procedure:

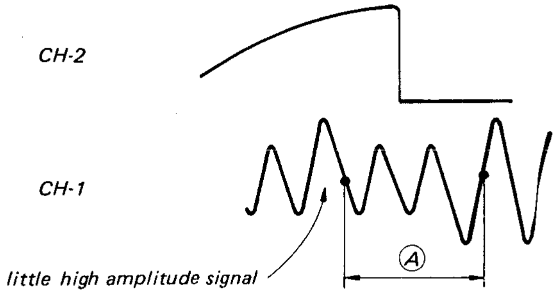
(1) Check that the relationship between the CTL signal and the time code signal meets the required specification.

Adjustment procedure:

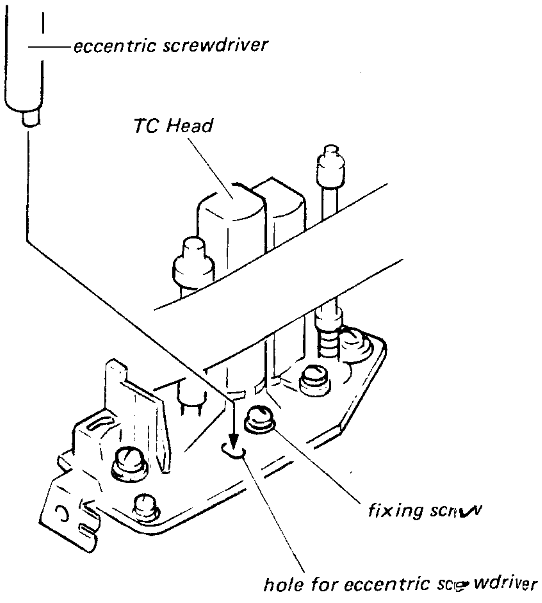
(1) Loosen the fixing screw about 1/2 to 1 turn.

(2) Insert the eccentric screwdriver into the hole, as shown in the figure. Adjust the TC Head Position to meet the required specification.





Spec.: The falling edge is within Ⓐ period.



8-14. SWITCHING POSITION ADJUSTMENT

8-14-1. R/P Head Switching Position Adjustment

Mode: Playback the alignment tape

Tool: Alignment tape, RR5-1SD PAL
Dual trace oscilloscope

Preparation:

(1) Remove the Rear Panel and Lower Case.

(2) Connect the oscilloscope as follows:
CH-1 : RF OUT connector on the connector panel
CH-2 : TP2/IF-99 on VO-12 Board
EXT.TRIG : TP2/IF-99
GND : E2/IF-99

(3) Short between TP3 and GND on the SV-57C Board with a short clip lead.

(4) Turn the TRACKING control knob to the center detent position.

(5) Playback the alignment tape.

Check procedure:

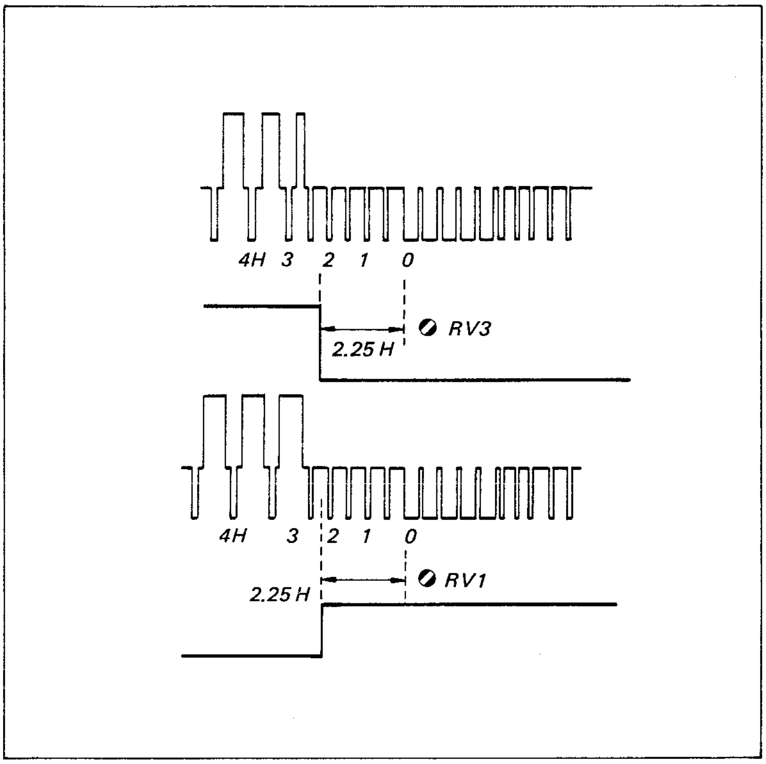
(1) Check that the waveform at the switching pulse portion meets the required specification.

(2) If it meets the required specification, disconnect the short clip lead.

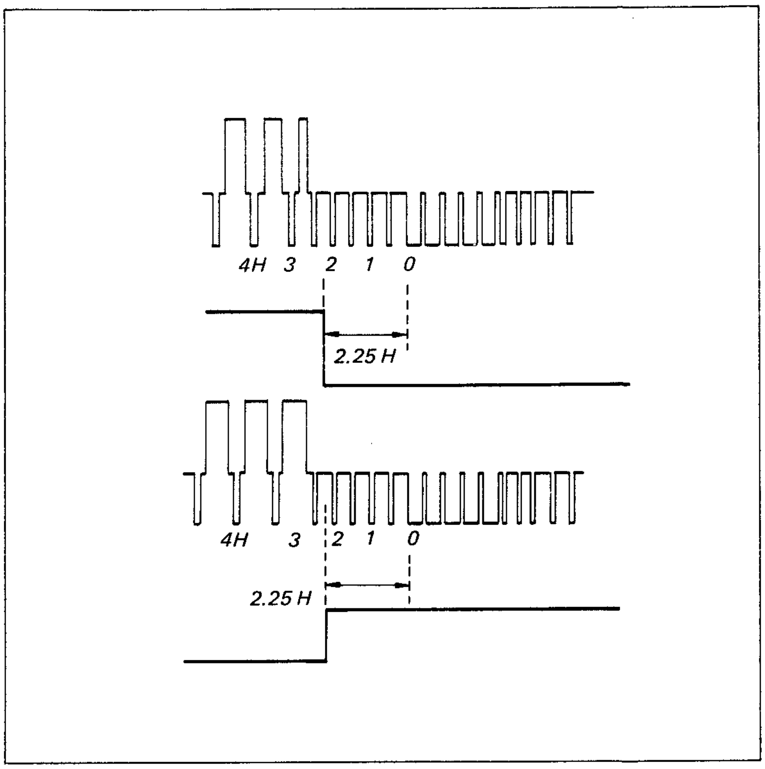
Adjustment procedure:

(1) Adjust RV1 and RV3/SV-57C Board to meet the required specification.

(2) After adjustment, disconnect the short clip lead.



8-14-2. Confidence Head Switching Position Adjustment



Mode: REC mode

Tool: KSP-S-20 cassette tape
Dual trace oscilloscope

Preparation:

(1) Remove the Rear Panel and Lower Case.

(2) Connect the video signal to the VIDEO IN connector.

(3) Connect the oscilloscope as follows:
CH-1 : TP53/VO-12 Board
CH-2 : TP2/IF-99 on VO-12 Board
EXT.TRIG : TP2/IF-99

(4) Insert the cassette tape

(5) Put the machine into the REC mode.

Check procedure:

(1) Check that the waveform at the switching pulse portion meets the required specification.

Adjustment procedure:

(1) Adjust RV8/SV-57C Board to meet the required specification.

8-15. VIDEO HEAD DIHEDRAL ADJUSTMENT

. This adjustment is performed only for the REC/PB Head.

Mode: Playback the alignment tape

Tool: Alignment tape, RR5-1SD PAL
Dihedral adjusting screw (four)
Monitor TV

Preparation:

(1) Connect a monitor-TV to the VTR.

(2) Playback the monoscope signal portion of the alignment tape.

Check procedure:

(1) Check that the vertical line of the monoscope signal under the switching pulse is playedback as one line.
(If two lines are visible, adjustment is required.)

Adjustment procedure:

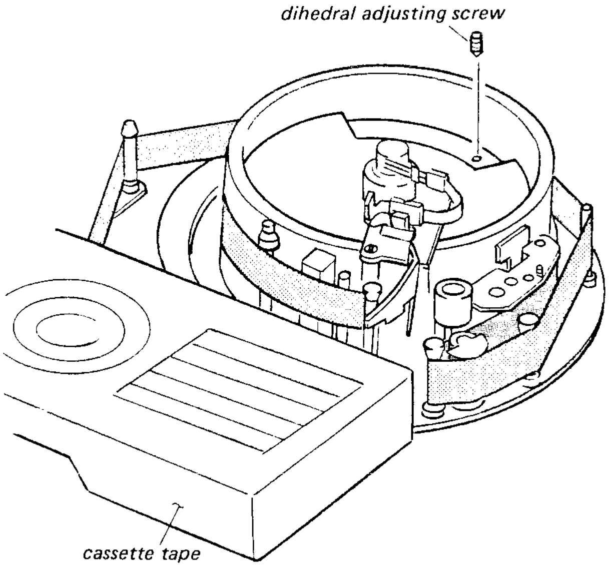
(1) Screw the four dihedral adjusting screws lightly into the upper drum.

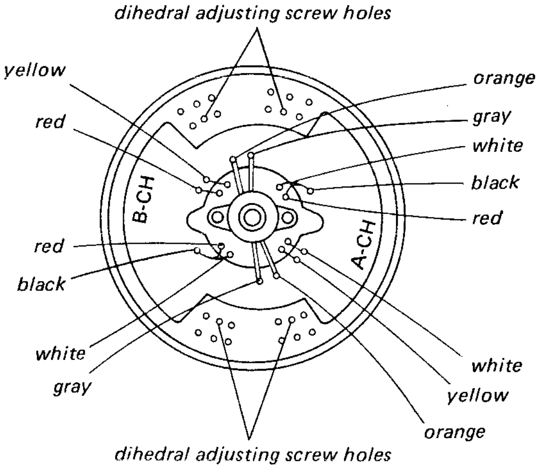
(2) Turn the adjusting screw adjacent to the CH-A head until it feels stiff.

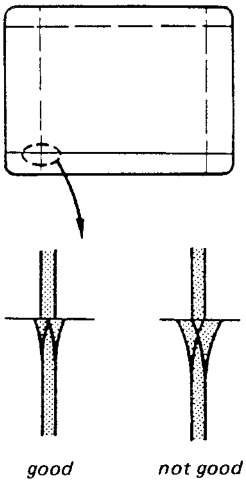
(3) If the screw is forward further, the video head will move, and the dihedral of the video head is adjusted.

(4) Playback the alignment tape. If the distortion of the vertical line has gotten worse, turn this screw back one turn and turn the other screw of the same video head so that the dihedral is corrected.

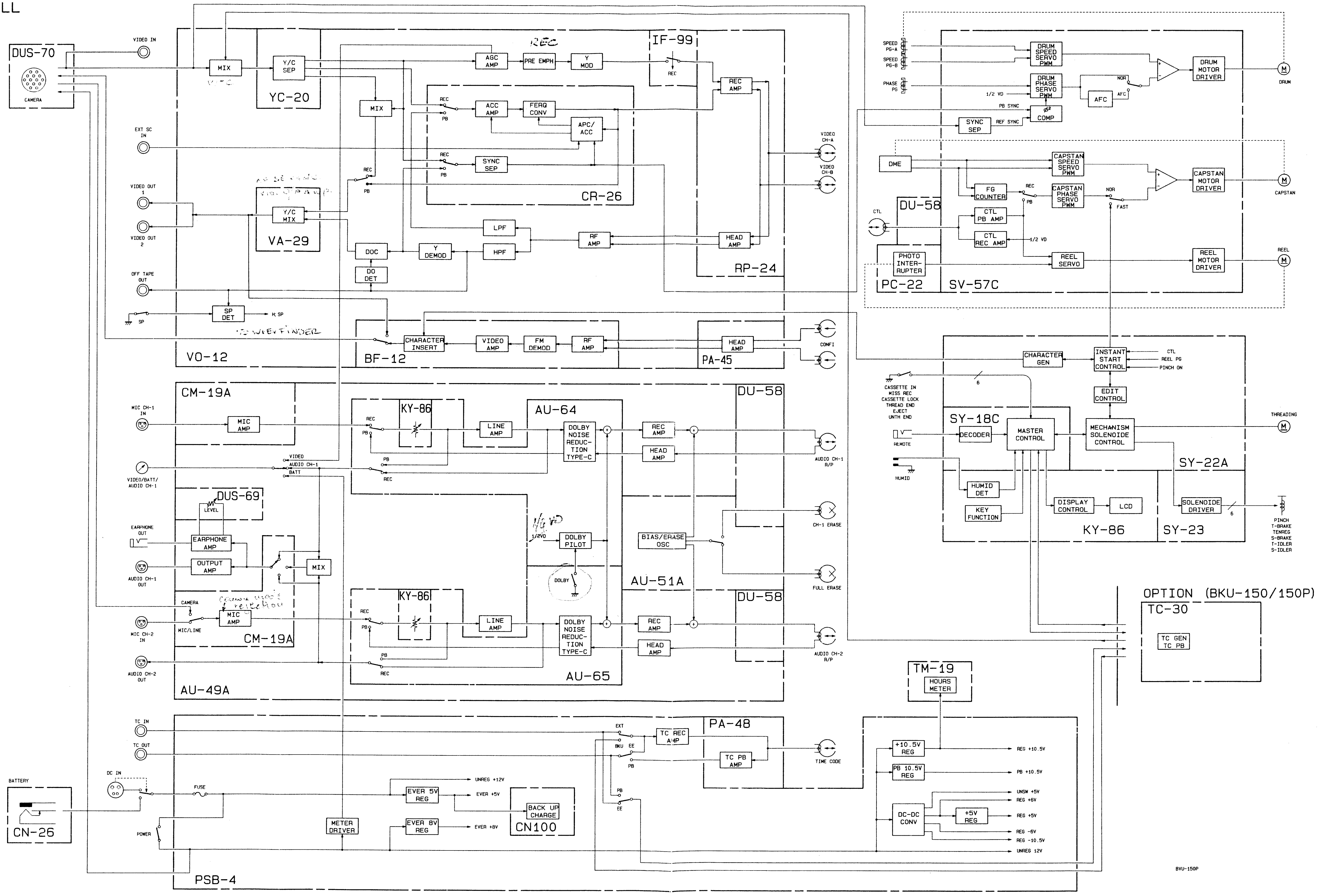
(5) After the adjustment, remove the dihedral adjusting screws and check again.







OVERALL


DUS-70
CAMERA
VIDEO IN
MIX
Y/C SEP
YC-20
AGC AMP
PRE EMPH
Y MOD
REC
IF-99
REC
REC AMP
MIX
ACC AMP
FERQ CONV
APC/ ACC
REC
PB
EXT SC IN
REC
SYNC SEP
PB
REC
PB
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HPF
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DO DET
Y DEMOD
RF AMP
HEAD AMP
RP-24
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SP
SP DET
H; SP
TO VIEWFINDER
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VIDEO AMP
FM DEMOD
RF AMP
HEAD AMP
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PA-45
CM-19A
MIC CH-1 IN
MIC AMP
KY-86
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PB
LINE AMP
AU-64
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HEAD AMP
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PB
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BATT
VIDEO/BATT/ AUDIO CH-1
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CH-1 ERASE
DOLBY
AU-51A
FULL ERASE
CAMERA
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CM-19A
MIC CH-2 IN
KY-86
REC
PB
LINE AMP
DOLBY NOISE REDUC-TION TYPE-C
REC AMP
HEAD AMP
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PB
REC
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AU-49A
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TC OUT
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BKU
EE
TC REC AMP
PA-48
TC PB AMP
PB
TIME CODE
PB
EE
BATTERY
CN-26
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FUSE
POWER
EVER 5V REG
UNREG +12V
EVER +5V
BACK UP CHARGE
CN100
METER DRIVER
EVER 8V REG
EVER +8V
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SPEED PG-B
PHASE PG
DRUM SPEED SERVO PWM
DRUM PHASE SERVO PWM
1/2 VD
PB SYNC
ϕ COMP
SYNC SEP
REF SYNC
NOR
AFC
AFC
DRUM MOTOR DRIVER
DRUM
DME
CAPSTAN SPEED SERVO PWM
FG COUNTER
REC
PB
CAPSTAN PHASE SERVO PWM
NOR
FAST
CAPSTAN MOTOR DRIVER
CAPSTAN
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DU-58
CTL PB AMP
CTL REC AMP
1/2 VD
REEL SERVO
REEL MOTOR DRIVER
REEL
PHOTO INTER-RUPTER
PC-22
SV-57C
CHARACTER GEN
INSTANT START CONTROL
CTL
REEL PG
PINCH ON
6
CASSETTE IN
MISS REC
CASSETTE LOCK
THREAD END
EJECT
UNTH END
EDIT CONTROL
SY-18C
DECODER
MASTER CONTROL
MECHANISM SOLENOIDE CONTROL
THREADING
REMOTE
HUMID
HUMID DET
KEY FUNCTION
DISPLAY CONTROL
LCD
SOLENOIDE DRIVER
6
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KY-86
SY-23
PINCH
T-BRAKE
TENREG
S-BRAKE
T-IDLER
S-IDLER
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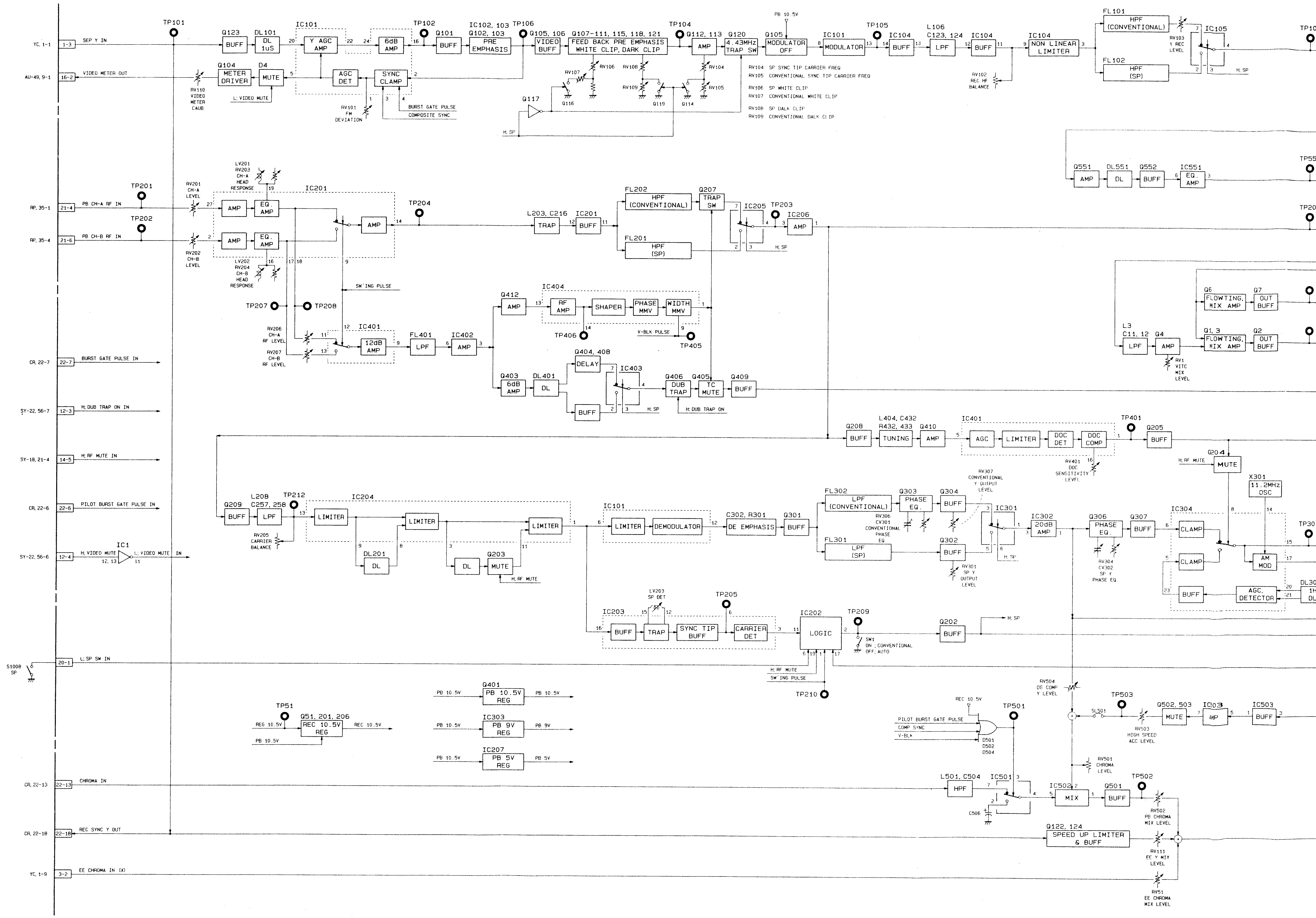
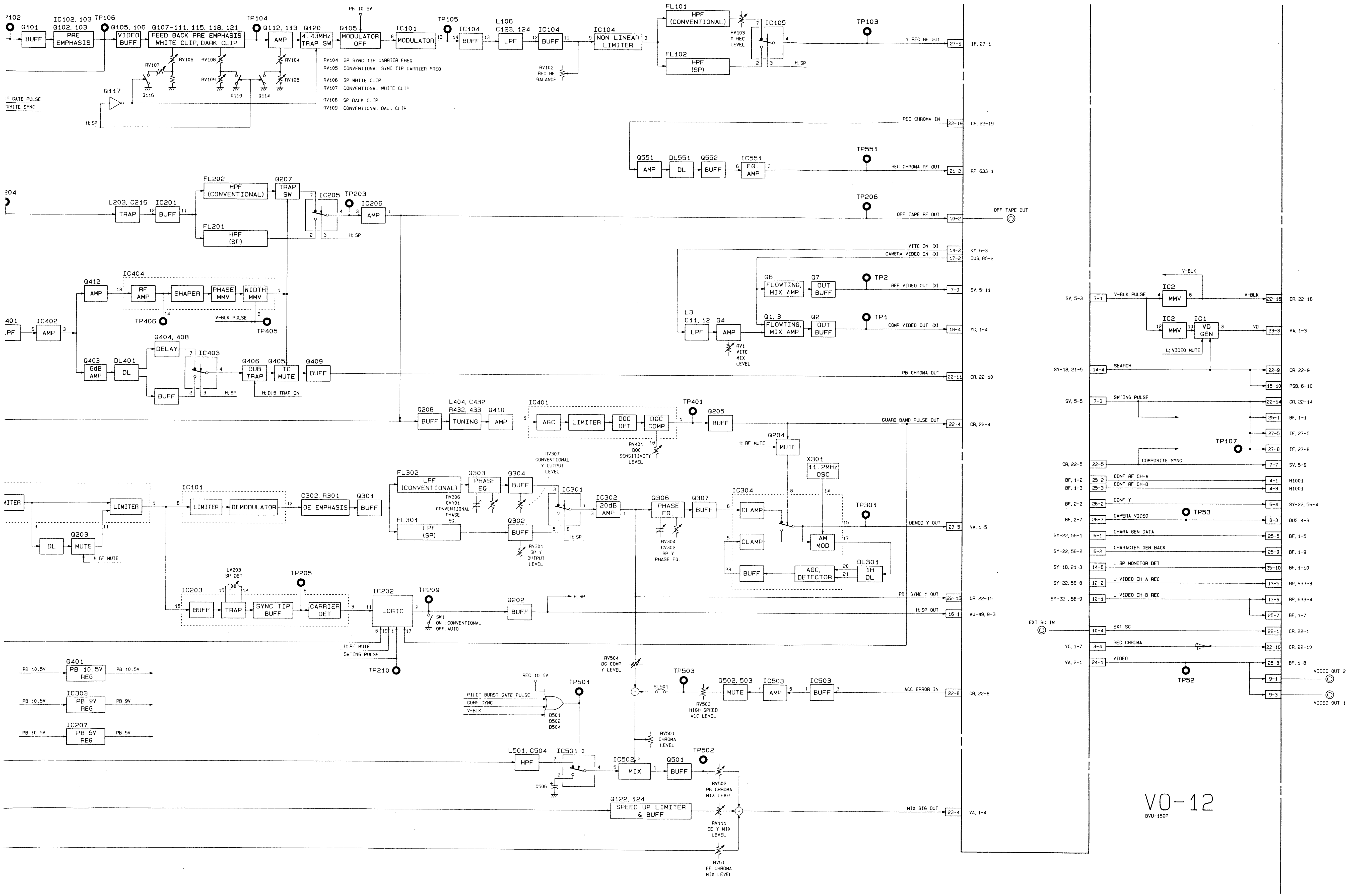
TC-30
TC GEN
TC PB
TM-19
HOURS METER
+10.5V REG
REG +10.5V
PB 10.5V REG
PB +10.5V
DC-DC CONV
+5V REG
UNSW +5V
REG +6V
REG +5V
REG -6V
REG -10.5V
UNREG 12V
BVU-150P
REC
V-Y-C
1/2 VD

Y MOD/DEMODULATOR




Q101
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IC102, 103
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TP106
Q105, 106
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Q107-111, 115, 118, 121
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TP105
IC104
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BUFF
IC104
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FL102
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IC105
H; SP
TP103
Y REC RF OUT
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RV105 CONVENTIONAL SYNC TIP CARRIER FREQ
RV106 SP WHITE CLIP
RV107 CONVENTIONAL WHITE CLIP
RV108 SP DARK CLIP
RV109 CONVENTIONAL DARK CLIP
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POSITE SYNC
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Q552
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TP206
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SHAPER
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TP405
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Q7
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TP2
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L3
C11, 12
Q4
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Q1, 3
FLOWTING, MIX AMP
Q2
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TP1
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IC402
LPF
AMP
Q403
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DL401
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BUFF
IC403
Q406
DUB TRAP
Q405
TC MUTE
Q409
BUFF
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H; DUB TRAP ON
PB CHROMA OUT
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CR, 22-10
Q208
BUFF
L404, C432
R432, 433
TUNING
Q410
AMP
IC401
AGC
LIMITER
DOC DET
DOC COMP
TP401
Q205
BUFF
RV401
DOC SENSITIVITY LEVEL
GUARD BAND PULSE OUT
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CR, 22-4
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X301
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LIMITER
DL
Q203
MUTE
H; RF MUTE
IC101
LIMITER
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Q301
BUFF
FL302
LPF (CONVENTIONAL)
Q303
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Q304
BUFF
RV306
CV301
CONVENTIONAL PHASE EQ
RV307
CONVENTIONAL Y OUTPUT LEVEL
FL301
LPF (SP)
Q302
BUFF
RV301
SP Y OUTPUT LEVEL
IC301
H; SP
IC302
20dB AMP
Q306
PHASE EQ.
RV304
CV302
SP Y PHASE EQ.
Q307
BUFF
IC304
CLAMP
CLAMP
BUFF
AM MOD
AGC, DETECTOR
DL301
1H DL
TP301
DEMOD Y OUT
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VA, 1-5
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LV203
SP DET
TP205
BUFF
TRAP
SYNC TIP BUFF
CARRIER DET
IC202
LOGIC
TP209
SW1
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OFF; AUTO
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BUFF
H; SP
PB SYNC Y OUT
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16-1
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Q401
PB 10.5V REG
PB 10.5V
IC303
PB 9V REG
PB 9V
IC207
PB 5V REG
PB 5V
RV504
DG COMP Y LEVEL
REC 10.5V
PILOT BURST GATE PULSE
COMP SYNC
V-BLK
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D502
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IC502
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BUFF
TP502
RV502
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RV111
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MIX SIG OUT
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MMV
V-BLK
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IC1
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BF, 1-3
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4-3
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26-7
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22-10
CR, 22-10
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24-1
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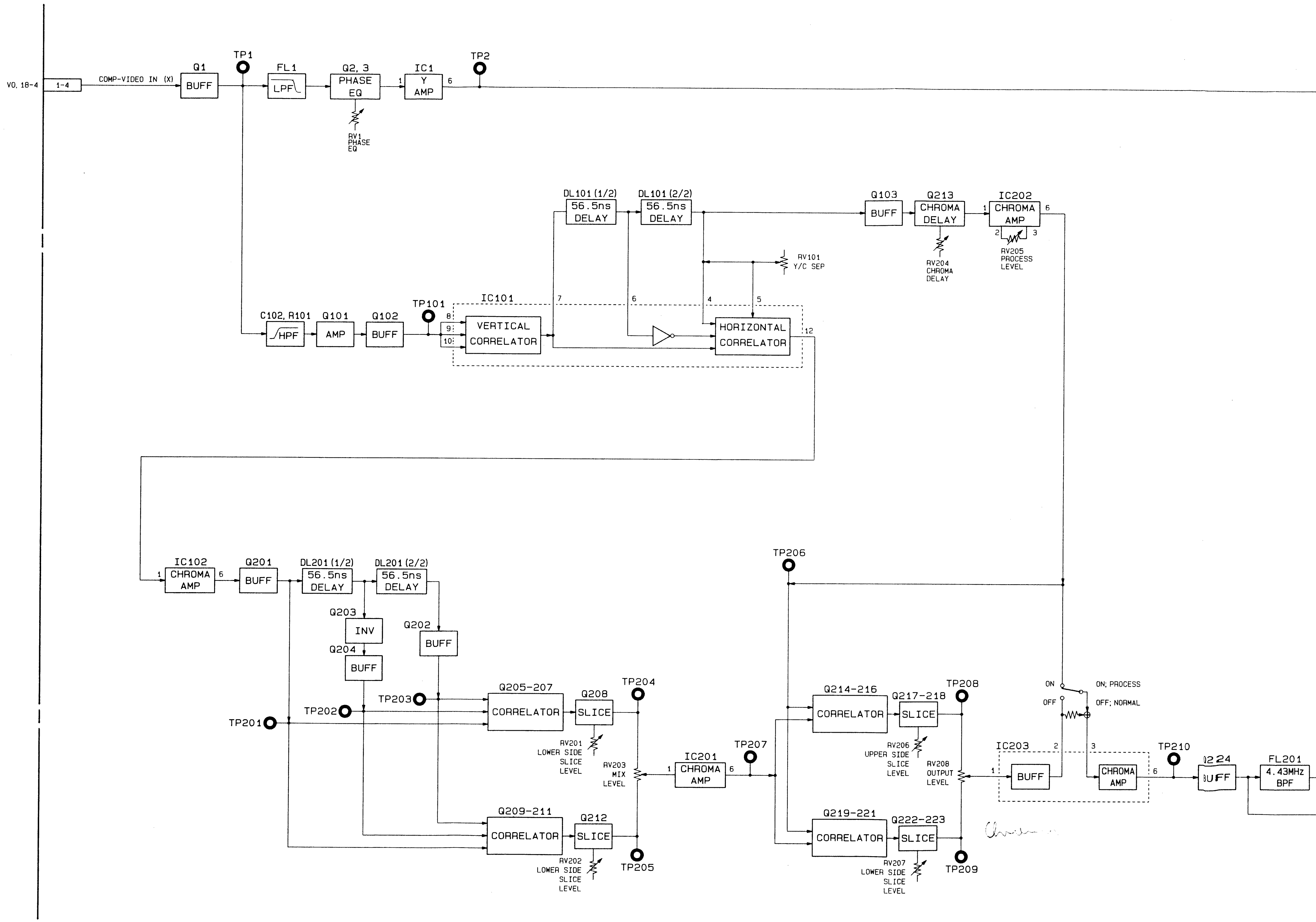
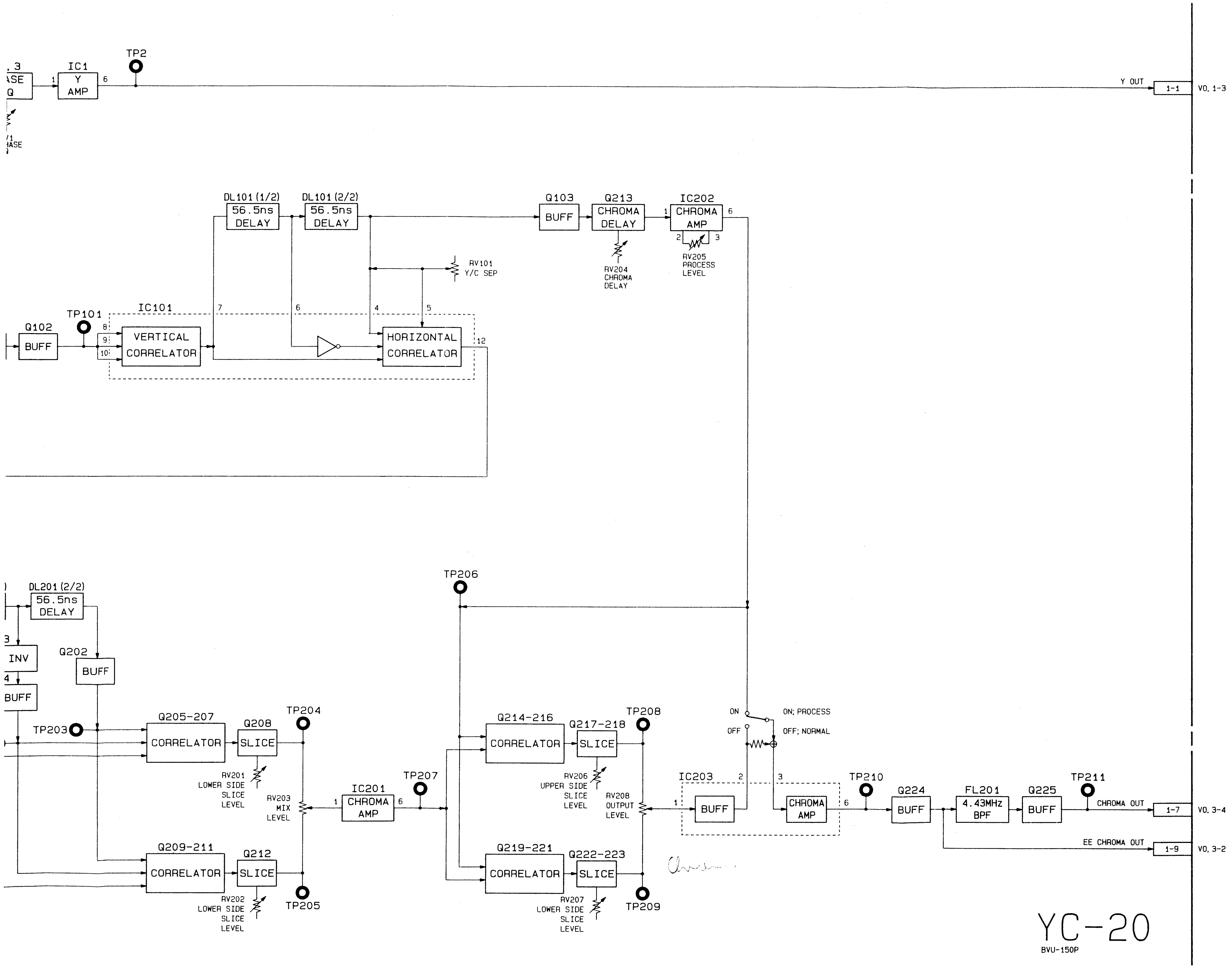
TP52
25-8
BF, 1-8
9-1
VIDEO OUT 2
9-3
VIDEO OUT 1
VO-12
BVU-150P

Y/C SEPARATOR




IC1
Y AMP
TP2
Y OUT
1-1
VO, 1-3
DL101 (1/2)
56.5ns DELAY
DL101 (2/2)
56.5ns DELAY
Q103
BUFF
Q213
CHROMA DELAY
RV204 CHROMA DELAY
IC202
CHROMA AMP
RV205 PROCESS LEVEL
RV101 Y/C SEP
TP101
Q102
BUFF
IC101
VERTICAL CORRELATOR
HORIZONTAL CORRELATOR
DL201 (2/2)
56.5ns DELAY
INV
Q202
BUFF
BUFF
TP203
Q205-207
CORRELATOR
Q208
SLICE
RV201 LOWER SIDE SLICE LEVEL
TP204
RV203 MIX LEVEL
IC201
CHROMA AMP
TP207
TP206
Q209-211
CORRELATOR
Q212
SLICE
RV202 LOWER SIDE SLICE LEVEL
TP205
Q214-216
CORRELATOR
Q217-218
SLICE
RV206 UPPER SIDE SLICE LEVEL
TP208
RV208 OUTPUT LEVEL
Q219-221
CORRELATOR
Q222-223
SLICE
RV207 LOWER SIDE SLICE LEVEL
TP209
ON
OFF
ON; PROCESS
OFF; NORMAL
IC203
BUFF
CHROMA AMP
TP210
Q224
BUFF
FL201
4.43MHz BPF
Q225
BUFF
TP211
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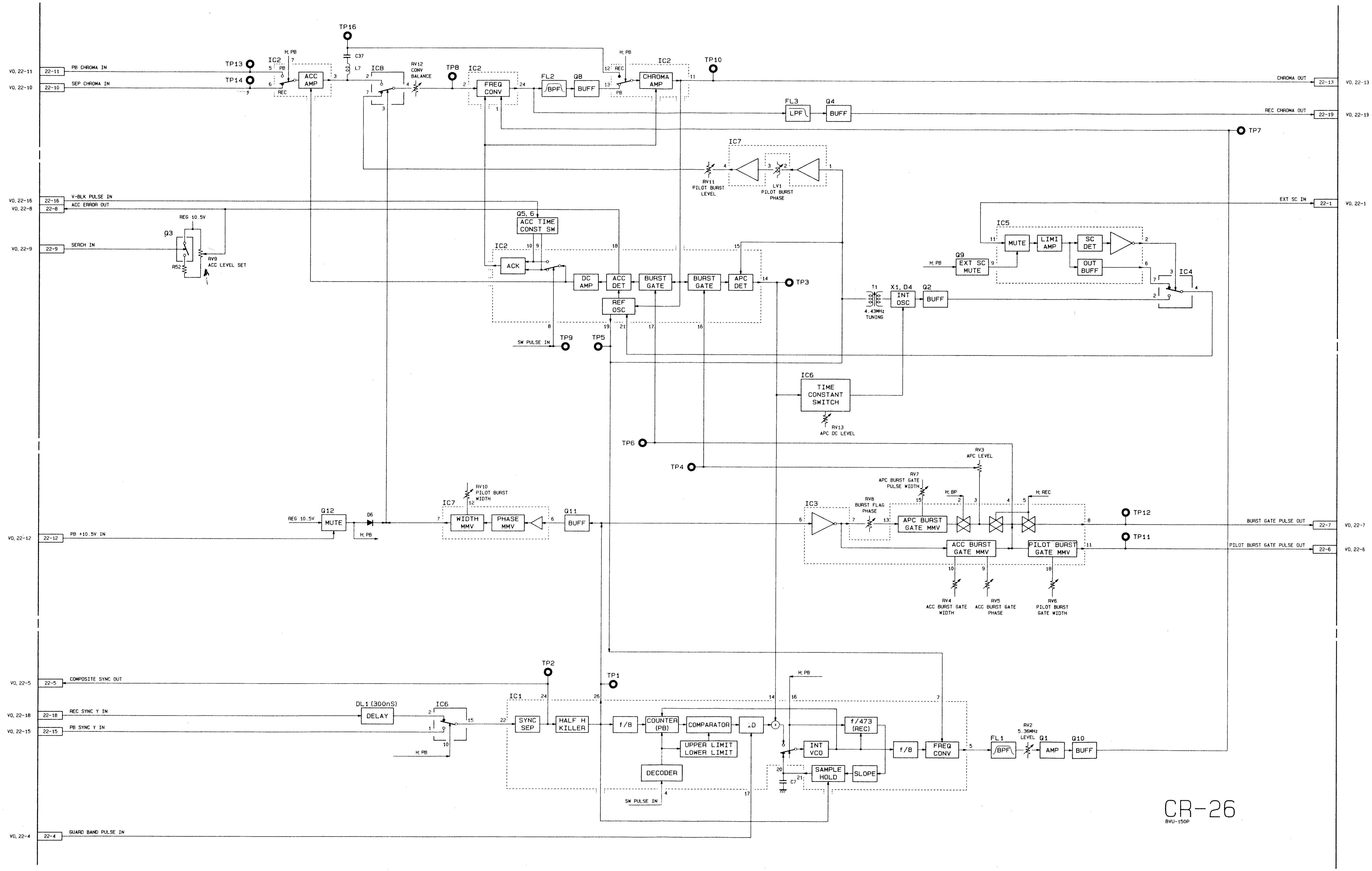
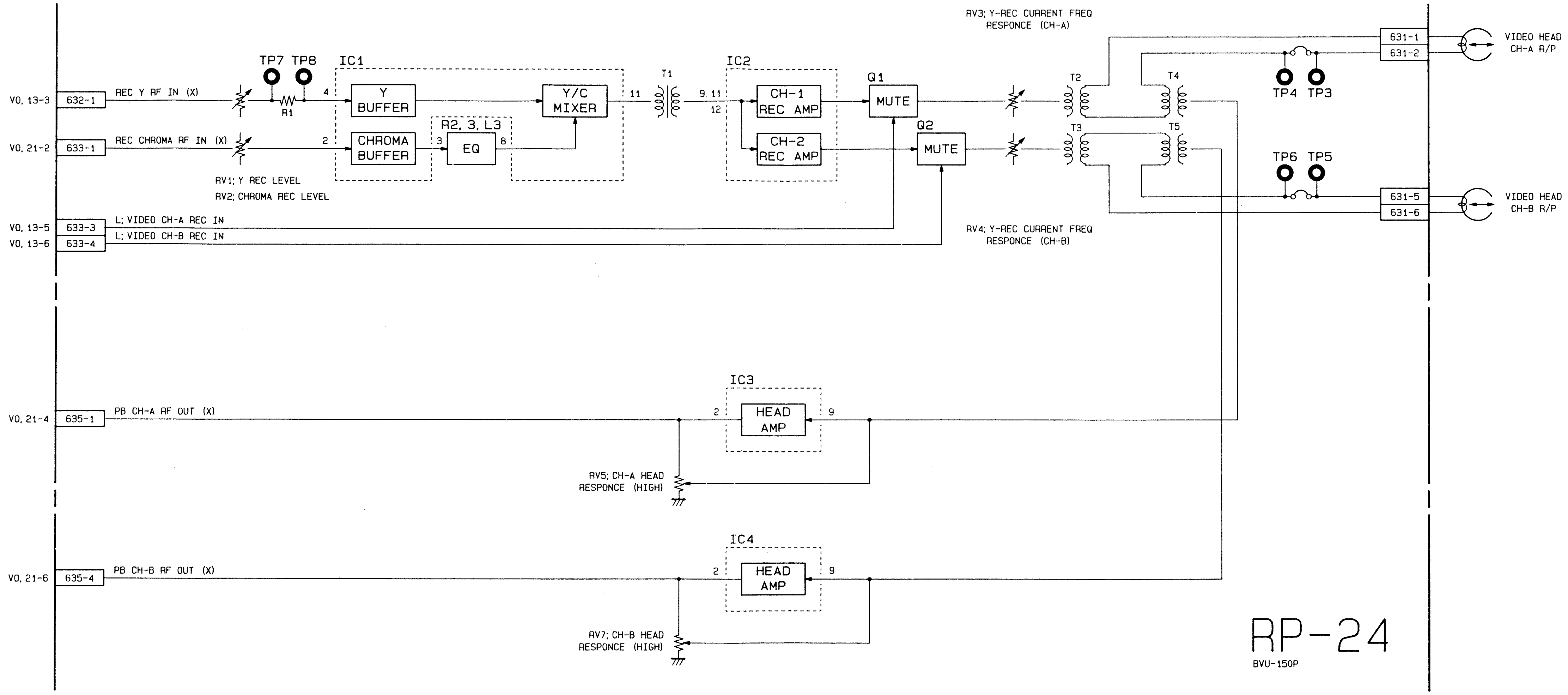
1-7
VO, 3-4
EE CHROMA OUT
1-9
VO, 3-2
YC-20
BVU-150P

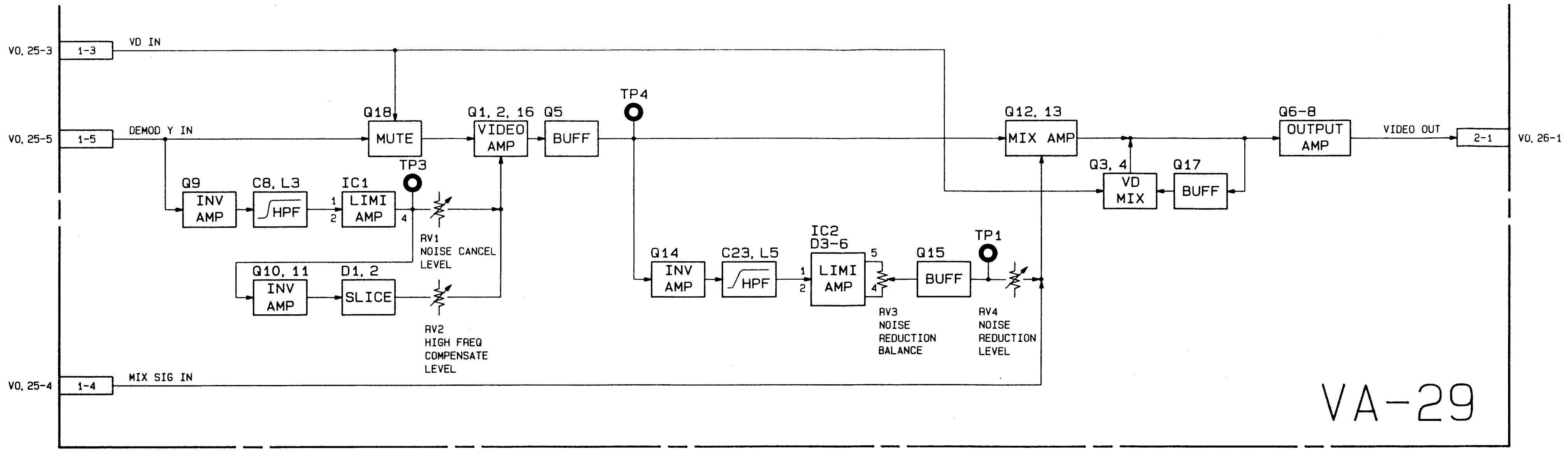
CHROMA MOD/DEMODULATOR

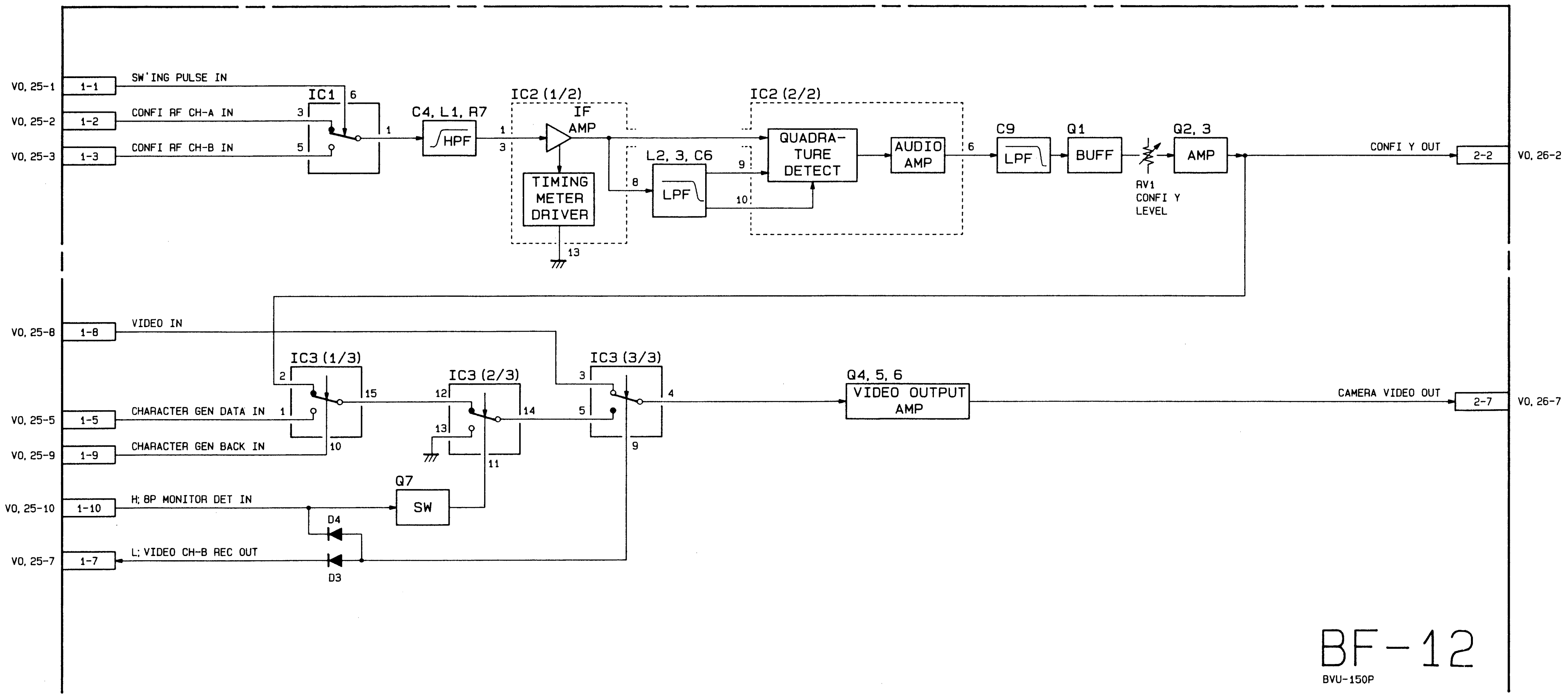


RF REC/PB AMPLIFIER

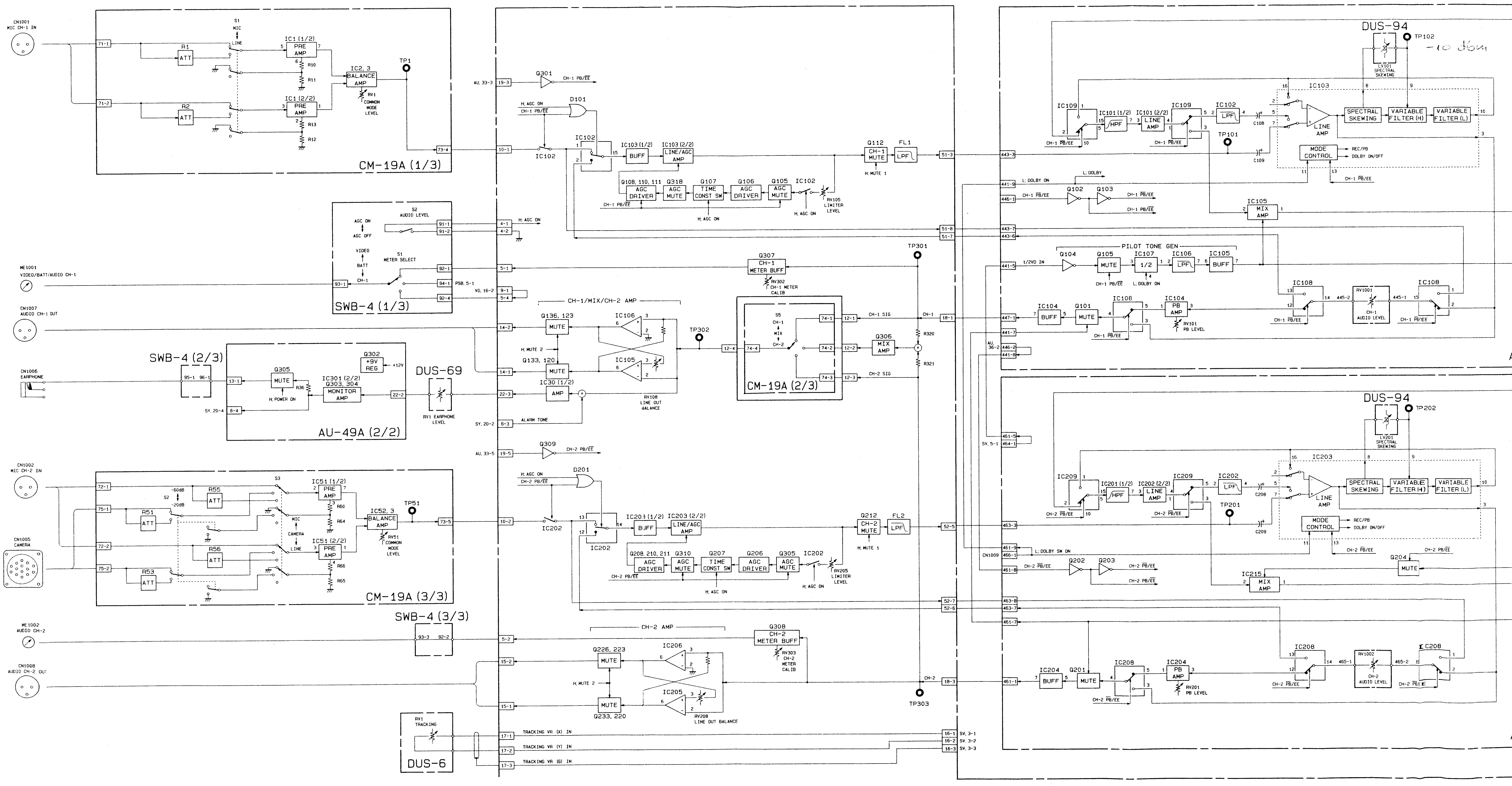


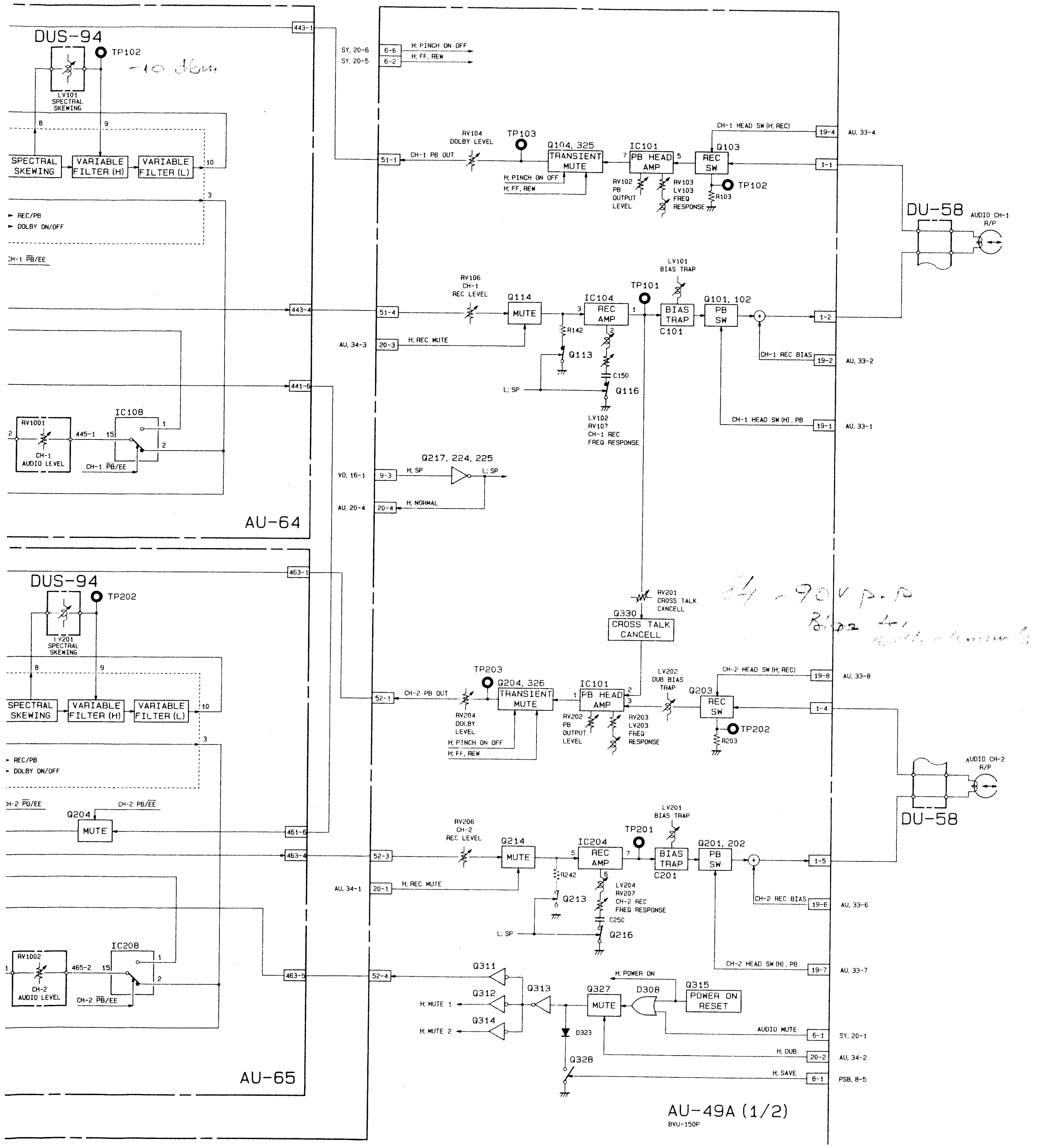
Y/C MIX AMPLIFIER
VIEW FINDER (CONFI VIDEO AMP)





JDIO REC/PB AMPLIFIER




DUS-94
TP102
-10 dBu
LV101 SPECTRAL SKEWING
SPECTRAL SKEWING
VARIABLE FILTER (H)
VARIABLE FILTER (L)
REC/PB
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IC108
445-1
CH-1 PB/EE
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MUTE
CH-2 PB/EE
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SY, 20-5
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H: FF, REW
CH-1 PB OUT
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TP103
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IC101 PB HEAD AMP
Q103 REC SW
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RV102 PB OUTPUT LEVEL
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TP102
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TP101
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C101
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Q113
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L: SP
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H: NORMAL
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Q330 CROSS TALK CANCELL
4/ -90V p-p
R'02
CH-2 PB OUT
TP203
Q204, 326 TRANSIENT MUTE
IC101 PB HEAD AMP
LV202 DUB BIAS TRAP
Q203 REC SW
CH-2 HEAD SW (H: REC)
AU, 33-8
RV204 DOLBY LEVEL
RV202 PB OUTPUT LEVEL
RV203 LV203 FREQ RESPONSE
R203
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BIAS TRAP
C201
Q201, 202 PB SW
R242
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52-3
1-5
20-1
19-6
19-7
52-4
6-1
20-2
8-1
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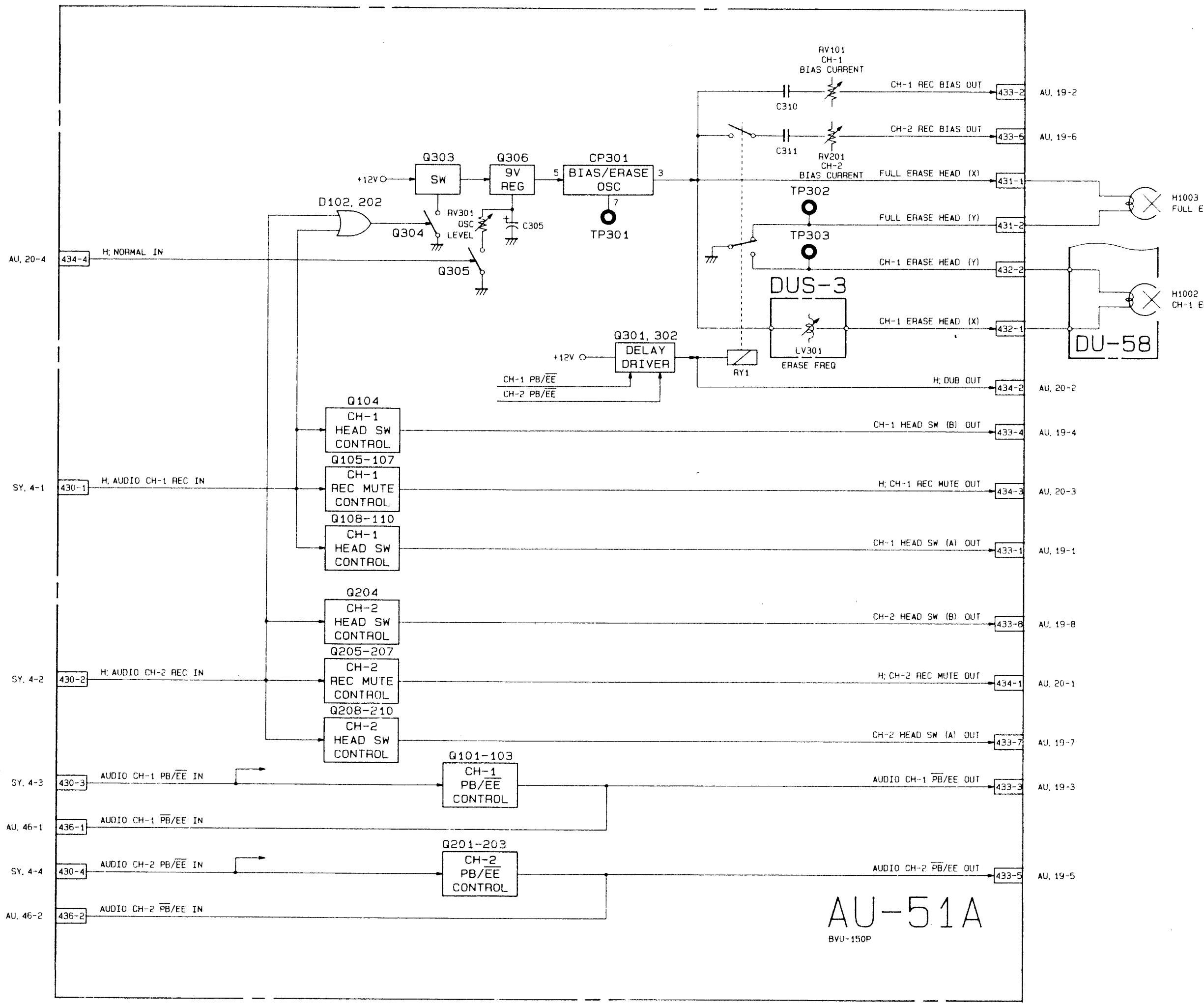
BVU-150P


RV101 CH-1 BIAS CURRENT
C310
CH-1 REC BIAS OUT
AU, 19-2
C311
RV201 CH-2 BIAS CURRENT
CH-2 REC BIAS OUT
AU, 19-6
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Q306 9V REG
CP301 BIAS/ERASE OSC
+12V
RV301 OSC LEVEL
C305
TP301
TP302
TP303
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FULL ERASE HEAD (Y)
CH-1 ERASE HEAD (Y)
CH-1 ERASE HEAD (X)
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H1002 CH-1 ERASE
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DUS-3
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RY1
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H: CH-1 REC MUTE OUT
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Q108-110 CH-1 HEAD SW CONTROL
CH-1 HEAD SW (A) OUT
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Q204 CH-2 HEAD SW CONTROL
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H: CH-2 REC MUTE OUT
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AUDIO CH-1 PB/EE OUT
AU, 19-3
AU, 46-1
AUDIO CH-1 PB/EE IN
Q201-203 CH-2 PB/EE CONTROL
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AUDIO CH-2 PB/EE IN
AUDIO CH-2 PB/EE OUT
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AUDIO CH-2 PB/EE IN
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431-2
434-4
432-2
432-1
434-2
433-4
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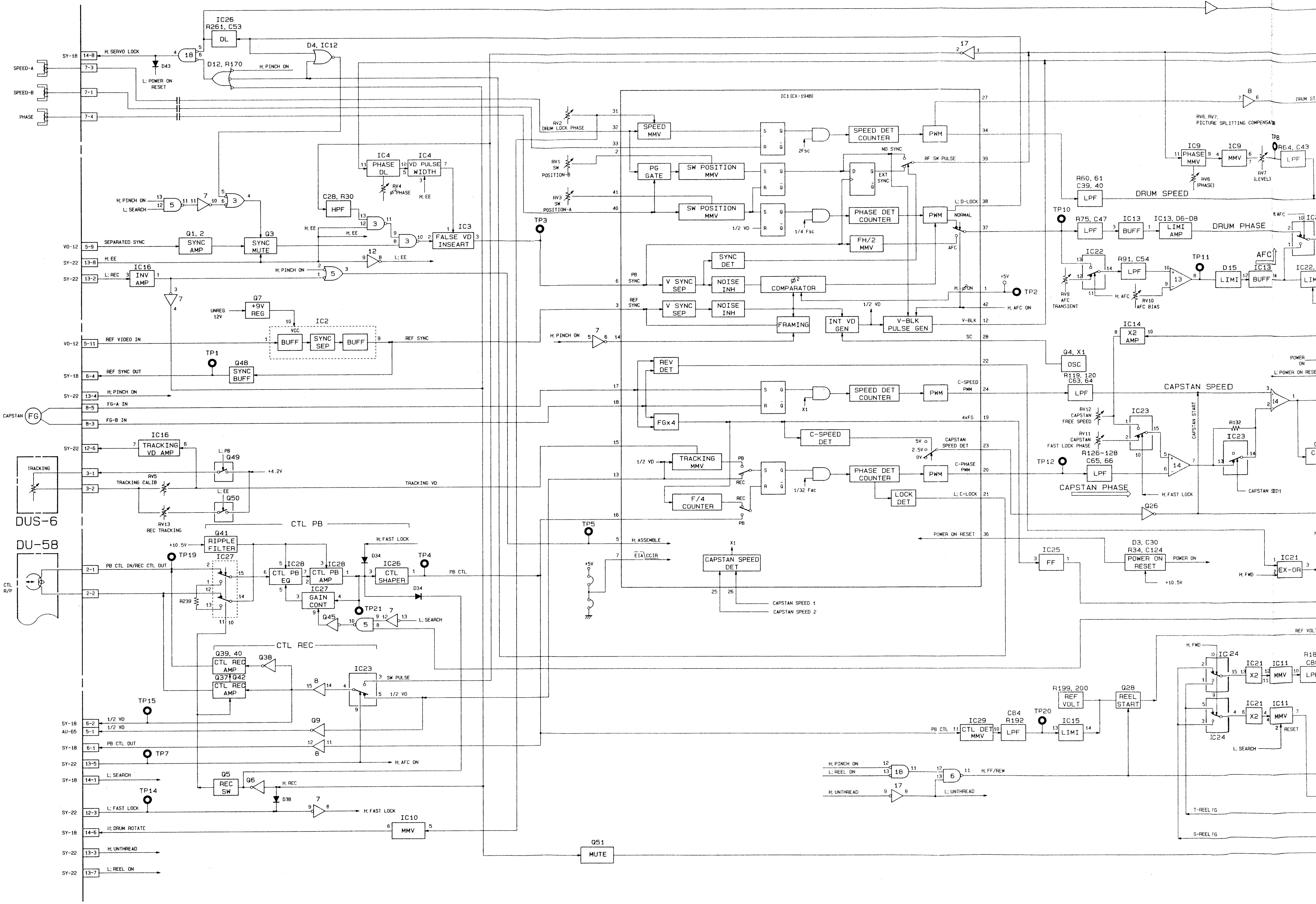
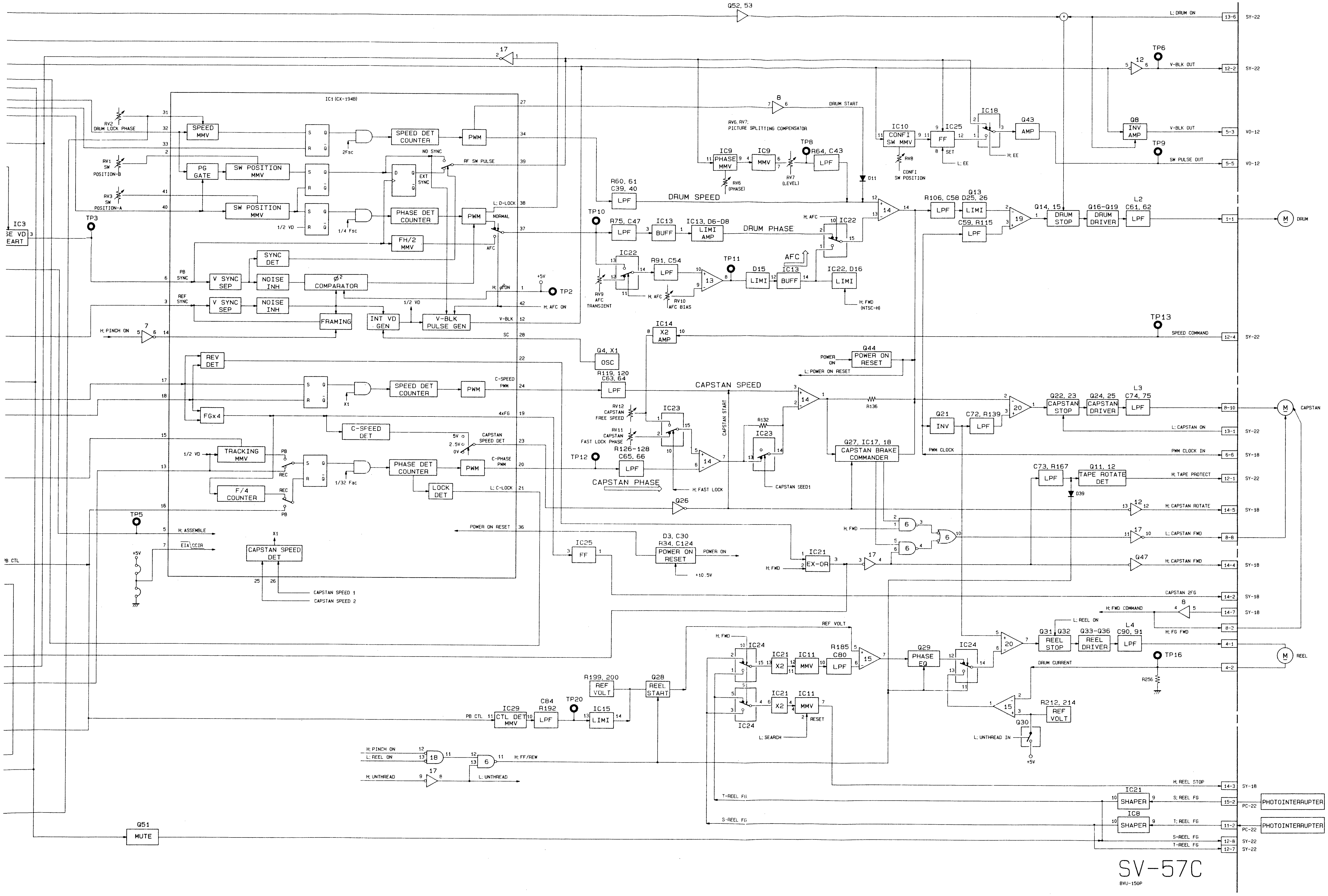
433-1
433-8
430-2
434-1
433-7
430-3
433-3
436-1
430-4
433-5
436-2
AU-51A
BVU-150P

SERVO SYSTEM




IC1 (CX-194B)
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IC18
IC10
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IC25
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Q43
AMP
Q8
INV AMP
TP9
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RV8
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H; EE
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RV6, RV7; PICTURE SPLITTING COMPENSATOR
IC9
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MMV
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LPF
D11
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SPEED MMV
RV1 SW POSITION-B
RV3 SW POSITION-A
PG GATE
SW POSITION MMV
SPEED DET COUNTER
PWM
PHASE DET COUNTER
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2Fsc
1/4 Fsc
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EXT SYNC
RF SW PULSE
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AFC
1/2 VD
IC3
SE VD
EART
TP3
SYNC DET
PB SYNC
V SYNC SEP
NOISE INH
REF SYNC
ϕ COMPARATOR
FRAMING
INT VD GEN
V-BLK PULSE GEN
H; ϕON
+5V
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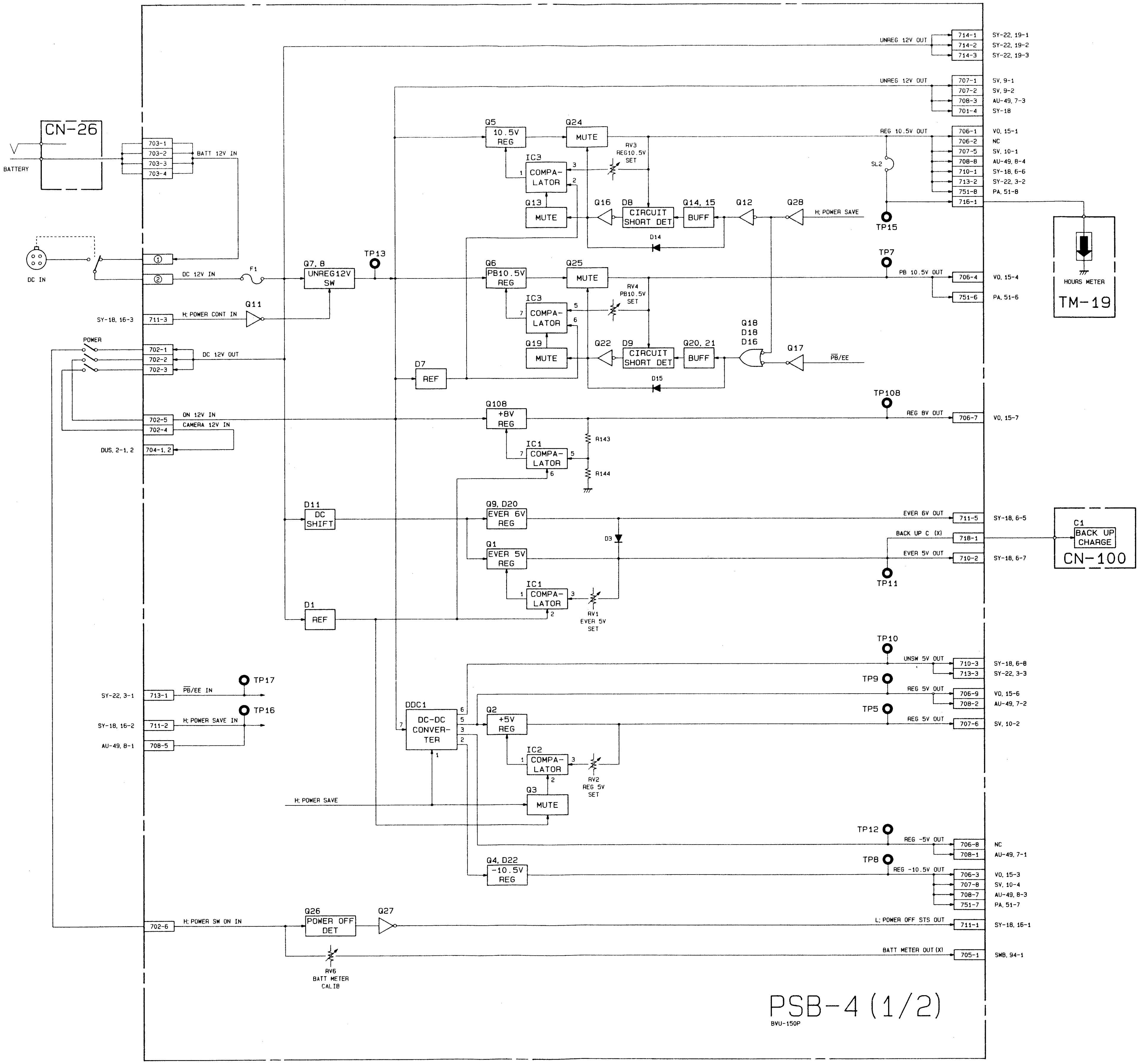
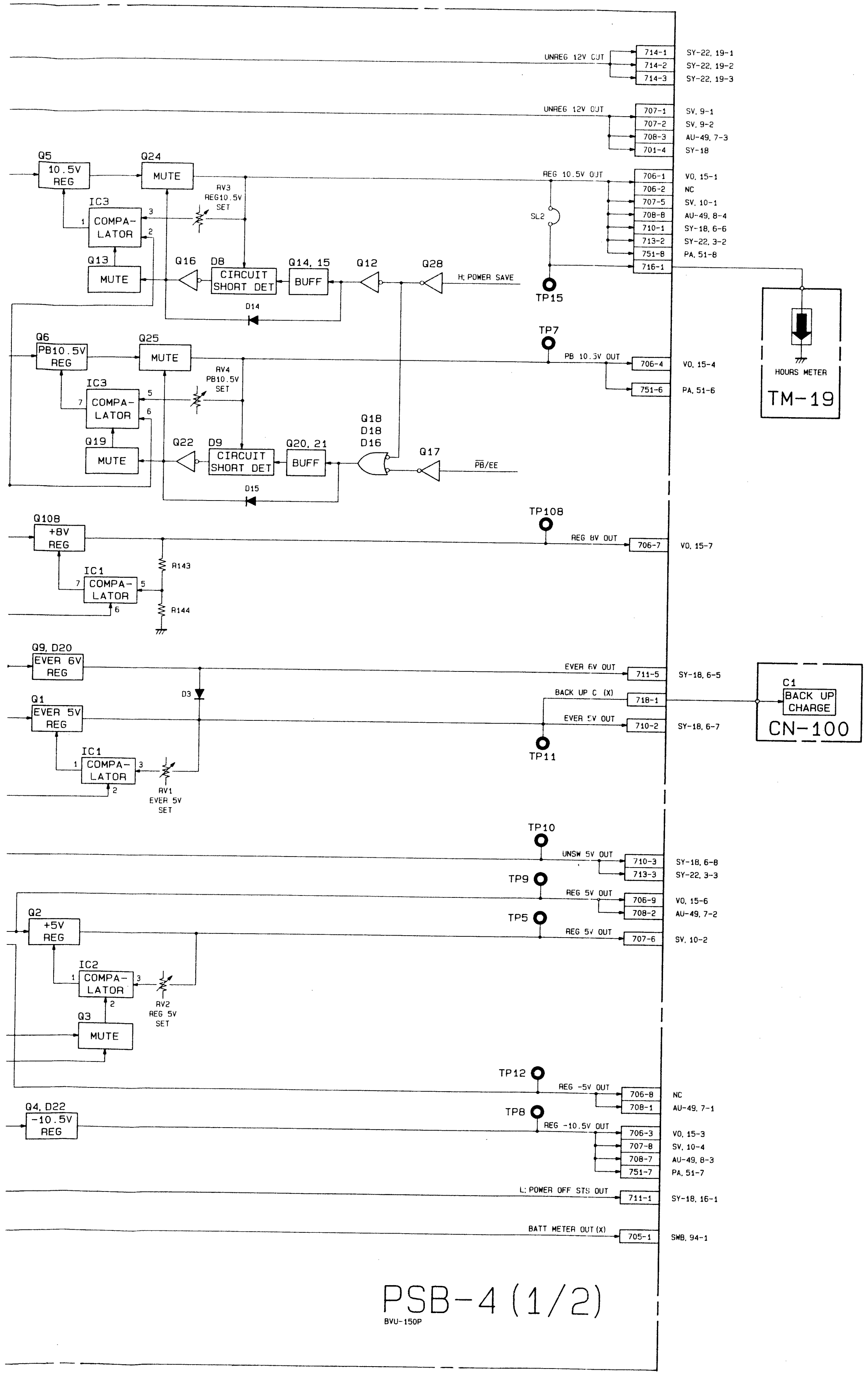
POWER SYSTEM

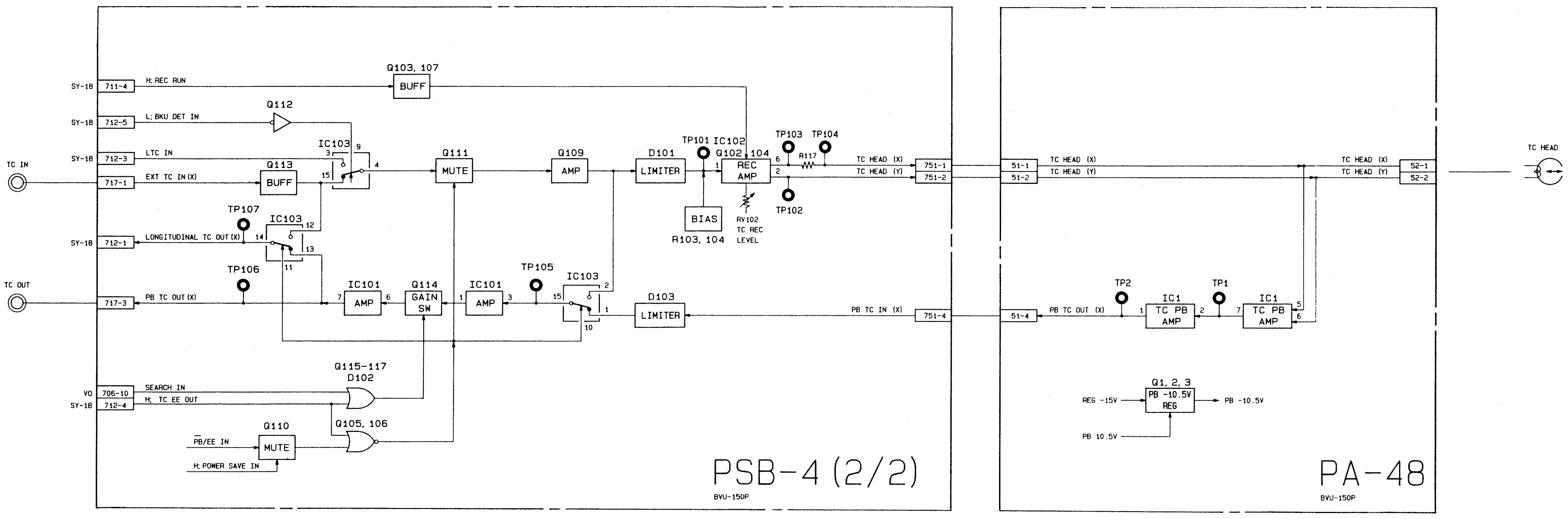




PSB-4 (1/2)

BVU-150P

TIME CODE REC/PB AMPLIFIER



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AFL25F15000G1 (MURATA)
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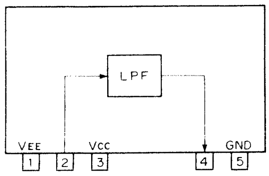
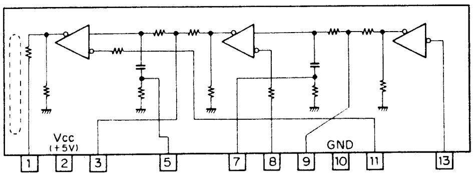
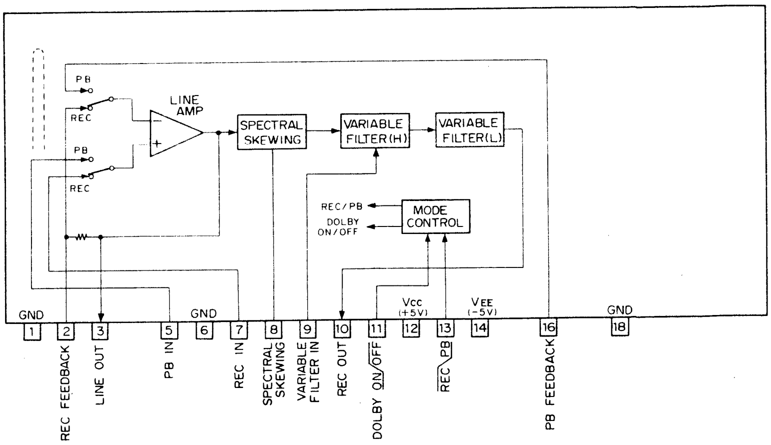


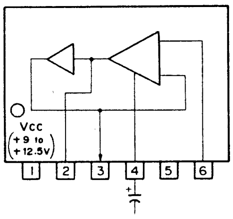
BX1140 (SONY)
HF AMP
— REAR VIEW —



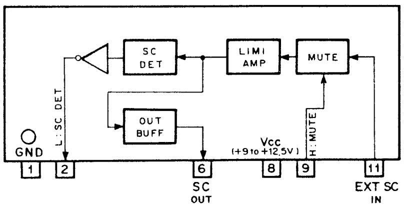
BX1152 (SONY)
DOLBY (C TYPE) NOISE REDUCTION SYSTEM
— REAR VIEW —



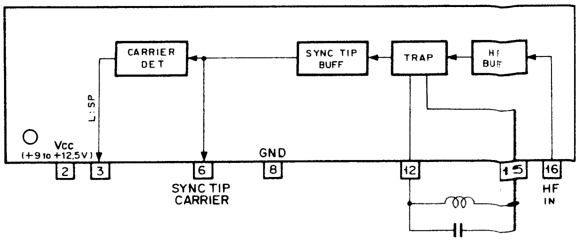
BX1247 (SONY)
LOWER FREQUENCY BOOSTER AMPLIFIER
— PRINTED SIDE VIEW —



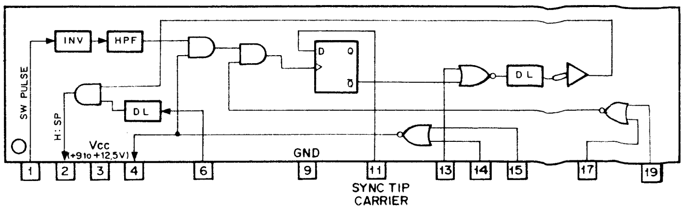
BX1251 (SONY)
EXTERNAL SUBCARRIER AMPLIFIER
— PRINTED SIDE VIEW —



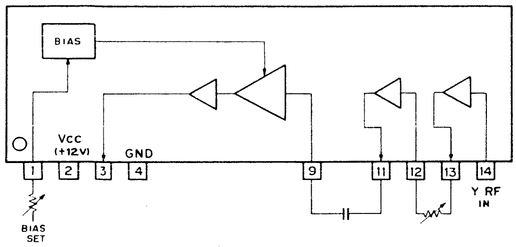
BX1253 (SONY)
SYNC TIP CARRIER DETECTOR AND NORMAL/SP MODE DETECTOR
— PRINTED SIDE VIEW —



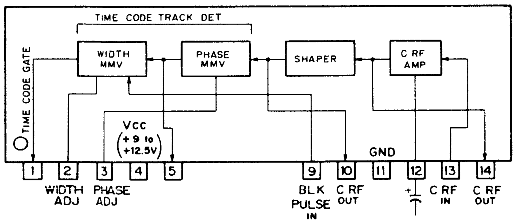
BX1254 (SONY)
NORMAL/SP MODE DETECTOR
— PRINTED SIDE VIEW —



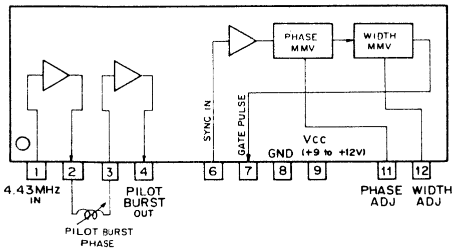
BX1257 (SONY)
Y-RF SIDE BAND EQUALIZER
— PRINTED SIDE VIEW —



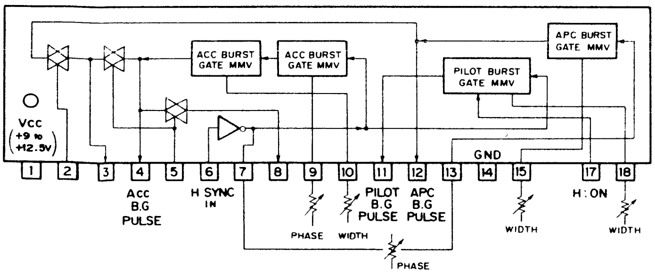
BX1258 (SONY)
TIME CODE MUTE GENERATOR
— PRINTED SIDE VIEW —



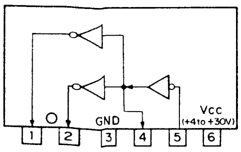
BX1262 (SONY)
PILOT BURST INSERTER
— PRINTED SIDE VIEW —



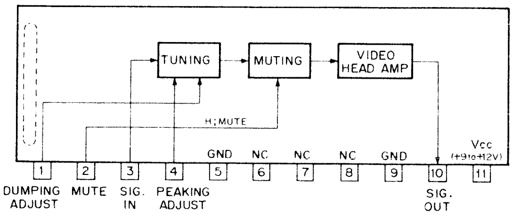
BX1264 (SONY)
ACC/APC BURST GATE PULSE GENERATOR
— PRINTED SIDE VIEW —



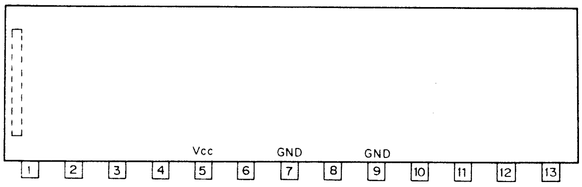
BX1354 (SONY)
PHASE INVERTER
— PRINTED SIDE VIEW —

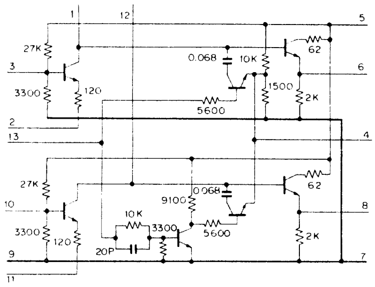


BX350 (SONY)
BX350A (SONY)
VIDEO HEAD AMP/MUTING
— REAR VIEW —

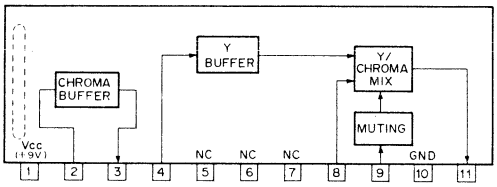


BX351 (SONY)
BX351A (SONY)
VIDEO EQUALIZER AMP/CHANNEL SWITCHING
-REAR VIEW-

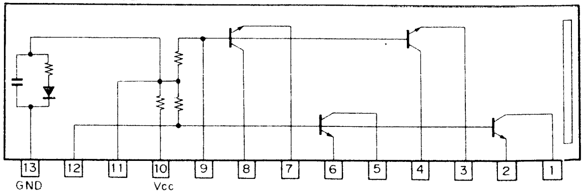




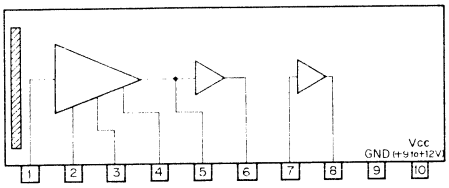
BX373 (SONY)
BX373A (SONY)
MIX AMP
— REAR VIEW —



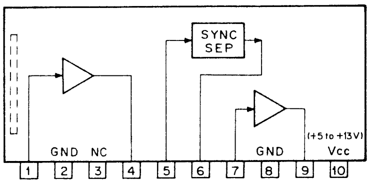
BX374 (SONY)
REC AMP
- IMPRINTED SIDE-



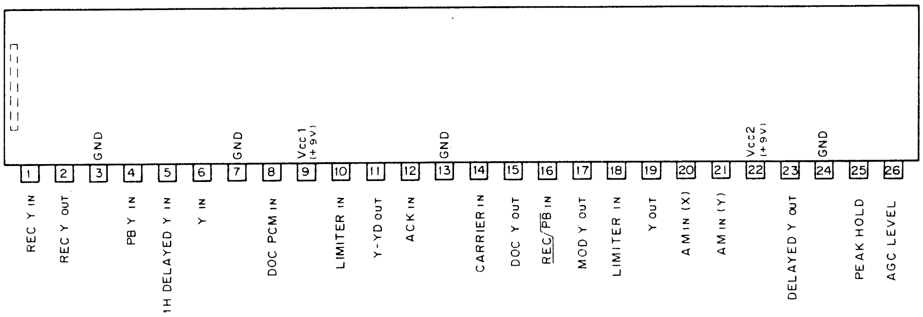
BX389 (SONY)
VIDEO AMPLIFIER
— PRINTED SIDE —

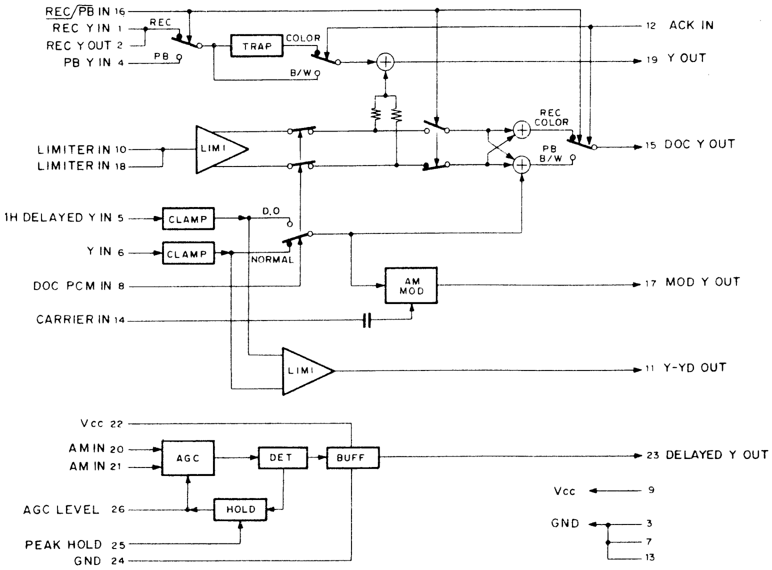


BX3915A (SONY)
SYNC SEPARATOR
— PRINTED SIDE —

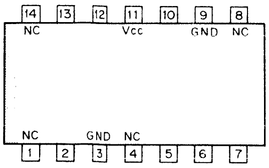


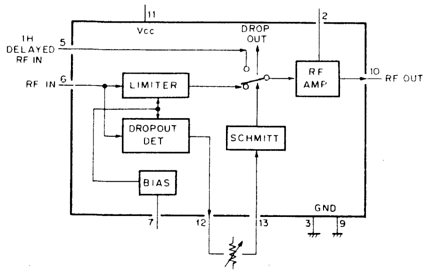
BX3949 (SONY)
COMB FILTER
— REAR VIEW —



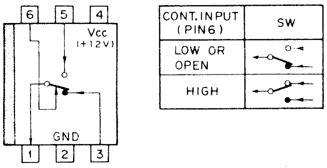


CX121A (SONY)
DROPOUT COMPENSATOR
— TOP VIEW —

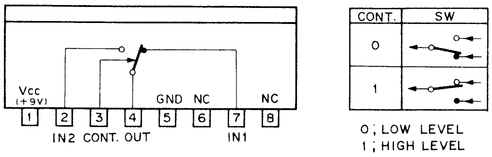




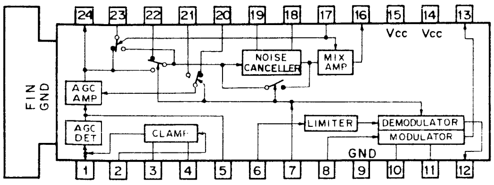
CX20060 (SONY)
ANALOG SWITCH
— TOP VIEW —



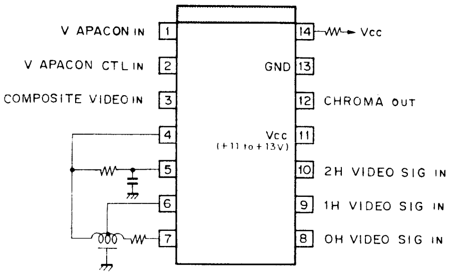
CX20061 (SONY)
ANALOG SWITCH
— SIDE VIEW —



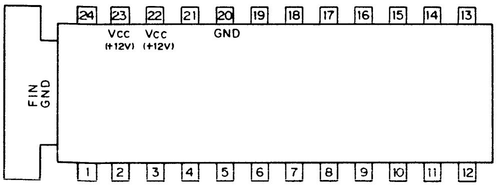
CX187 (SONY)
LUMINANCE SIGNAL PROCESSER
— TOP VIEW —

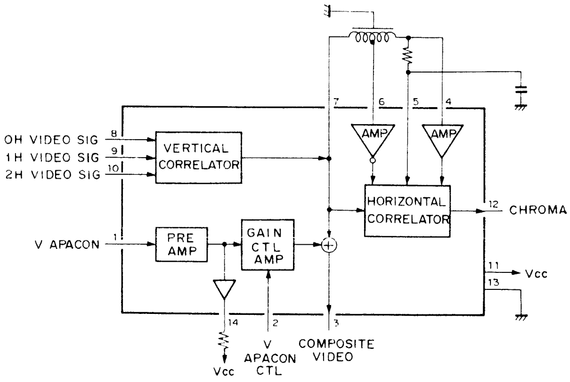


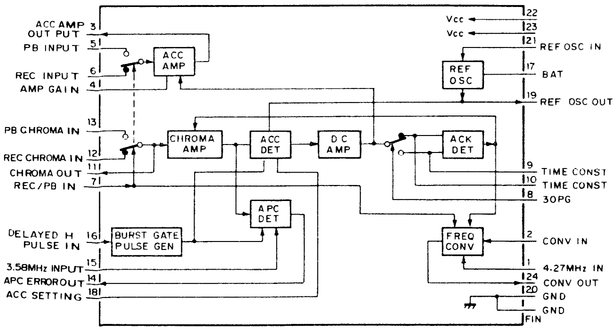
CX22013 (SONY)
DYNAMIC COMB FILTER
— TOP VIEW —



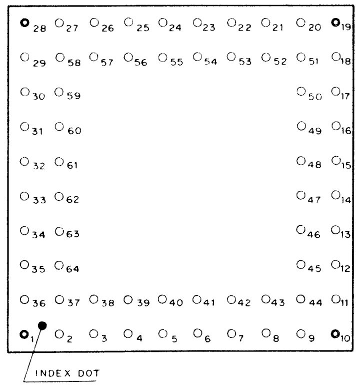
CX188
CHROMINANCE SIGNAL PROCESSER
— TOP VIEW —

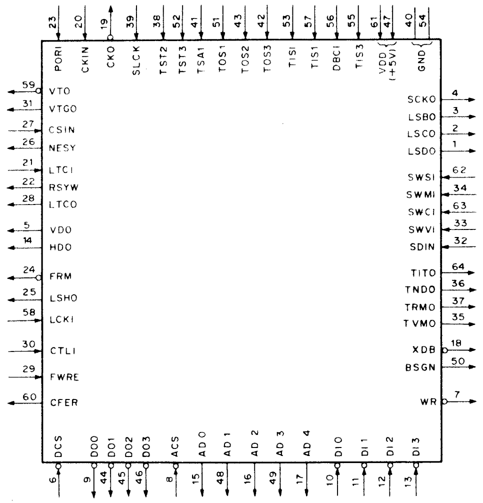






CX7907 (SONY)
CX7907A (SONY)
C-MOS TIME CODE GENERATOR
— TOP VIEW —

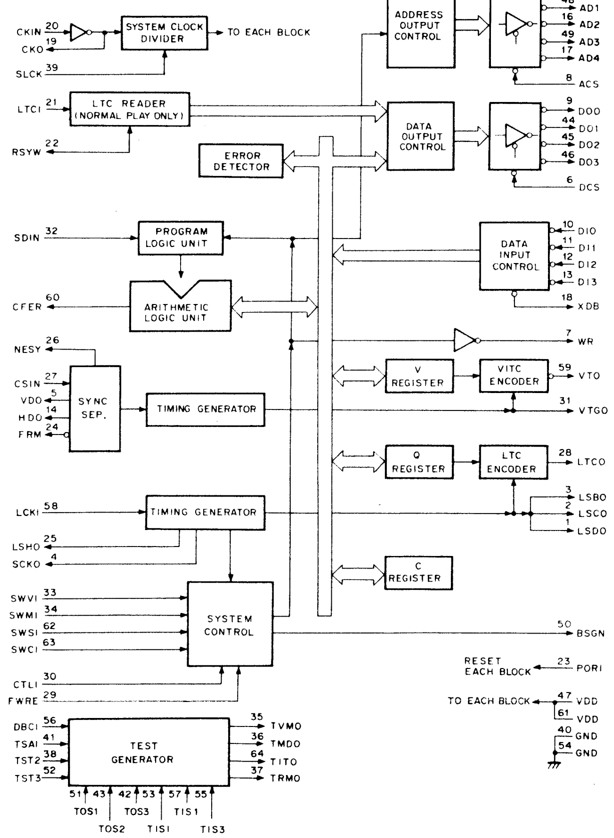




PIN ASSIGNMENT

Pin No.	IN	OUT	SYMBOL
1		o	LSDO
2		o	LSCO
3		o	LSBO
4		o	SCKO
5		o	VDO
6	o		DCS
7		o	WR
8	o		ACS
9		o	DO0
10	o		DI0
11	o		DI1
12	o		DI2
13	o		DI3
14		o	HDO
15		o	AD0
16		o	AD2
17		o	AD4
18		o	XDB
19		o	CKO
20	o		CKIN
21	o		LTCI
22		o	RSYW
23	o		PORI
24		o	FRM
25		o	LSHO
26		o	NESY
27	o		CSIN
28		o	LTCO
29	o		FWRE
30	o		CTLI
31		o	VTGO
32	o		SDIN
33	o		SWVI
34	o		SWMI
35		o	TVMO
36		o	TNDO
37		o	TRMO
38	o		TST2
39	o		SLCK
40		o	GND
41	o		TSAI
42	o		TOS3
43	o		TOS2
44		o	DO1
45		o	DO2
46		o	DO3
47	o		VDD(+5V)
48		o	AD1
49		o	AD3
50		o	BSGN
51	o		TOS1
52	o		TST3
53	o		TISI
54		o	GND
55	o		TIS3
56	o		DBCI
57	o		TIS1
58	o		LCKI
59		o	VTO
60		o	CFER
61	o		VDD(+5V)
62	o		SWSI
63	o		SWCI
64		o	TITO

BLOCK DIAGRAM



FUNCTIONAL PIN DEFINITION

Pin No.	SYMBOL	DESCRIPTION
8	ACS	ADDRESS LINE CHIP SELECT INPUT
15	AD0	ADDRESS DATA OUTPUT
48	AD1	
16	AD2	
49	AD3	
17	AD4	
50	BSGN	BUSY GENERATOR OUTPUT
60	CFER	COLOR FRAME ERROR FLAG OUTPUT
20	CKIN	SYSTEM CLOCK INPUT
19	CKO	CLOCK OUTPUT
27	CSIN	COMPOSITE SYNC INPUT
30	CTLI	CTL(TIMER) SIGNAL INPUT (⌐L)
6	DCS	DATA LINE CHIP SELECT INPUT (NEGATIVE-LOGIC)
10	DI0	DATA BUS INPUT (NEGATIVE-LOGIC)
11	DI1	
12	DI2	
13	DI3	
9	DO0	DATA BUS OUTPUT (NEGATIVE-LOGIC)
44	DO1	
45	DO2	
46	DO3	
24	FRM	FRAME SIGNAL OUTPUT (NEGATIVE-LOGIC)
29	FWRE	CTL DIRECTION INPUT
14	HDO	HORIZONTAL SYNC DRIVE OUTPUT
58	LCKI	LTC CLOCK INPUT (SMPTE 9.6kHz/EBU 8kHz)
3	LSBO	LTC SYNCHRONOUS SIGNAL B OUTPUT
2	LSCO	LTC SYNCHRONOUS SIGNAL C OUTPUT
1	LSDO	LTC SYNCHRONOUS SIGNAL D OUTPUT
25	LSHO	LTC SYNCHRONOUS SIGNAL H OUTPUT
21	LTCI	LTC INPUT
28	LTCO	LTC SIGNAL OUTPUT
26	NESY	LOST-SYNC FLAG OUTPUT
23	PORI	POWER ON RESET INPUT
22	RSYW	READ SYNC WORD OUTPUT
4	SCKO	SWITCHES SIGNAL IN CLOCK OUTPUT
32	SDIN	SERIAL DATA INPUT
39	SLCK	SELECT CLOCK INPUT
63	SWCI	SWITCHES SIGNAL C INPUT
34	SWMI	SWITCHES SIGNAL M INPUT
62	SWSI	SWITCHES SIGNAL S INPUT
33	SWVI	SWITCHES SIGNAL V INPUT
5	VDO	VERTICAL SYNC DRIVE OUTPUT
31	VTGO	VITC GATE SIGNAL OUTPUT
59	VTO	VITC SIGNAL OUTPUT (NEGATIVE-LOGIC)
7	WR	WRITE SIGNAL OUTPUT (NEGATIVE-LOGIC)
18	XDB	EXTERNAL DATA BUS IN FLAG OUTPUT (NEGATIVE-LOGIC)
47	VDD	POWER LINE (+5V)
61	VDD	
40	GND	GND LINE
54	GND	
56	DBCI	TEST INPUT (TO BE CONNECTED WITH GND)
57	TIS1	
55	TIS3	
53	TISI	
51	TOS1	
43	TOS2	
42	TOS3	
41	TSAI	
38	TST2	
52	TST3	
64	TITO	TEST OUTPUT (TO BE LEFT OPEN)
36	TNDO	
37	TRMO	
35	TVMO	

#33 SWVI

LSDO	LSCO	LSBO	SWVI	FUNCTION
0	0	0	SW1A†	VITC POSITION SELECT A
0	0	1	SW1B†	
0	1	0	SW1C†	
0	1	1	SW1D†	
1	0	0	SW2A†	VITC POSITION SELECT B
1	0	1	SW2B†	
1	1	0	SW2C†	
1	1	1	SW2D†	

†;VITC POSITION SELECT

SW1D SW2D	SW1C SW2C	SW1B SW2B	SW1A SW2A	INSERTION LINE	
				NTSC	PAL,SECAM
0	0	0	0	LINE 25	LINE 22,335
0	0	0	1	24	21,334
0	0	1	0	23	20,333
0	0	1	1	22	19,332
0	1	0	0	21	18,331
0	1	0	1	20	17,330
0	1	1	0	19	16,329
0	1	1	1	18	15,328
1	0	0	0	17	14,327
1	0	0	1	16	13,326
1	0	1	0	15	12,325
1	0	1	1	14	11,324
1	1	0	0	13	10,323
1	1	0	1	12	9,322
1	1	1	0	11	8,321
1	1	1	1	10	7,320

#32 SDIN

LSDO	LSCO	LSBO	SDIN	FUNCTION
0	0	0	⌐L	INCREASE IN BIT 'FR or U1'
0	0	1		INCREASE IN BIT 'FT or U2'
0	1	0		INCREASE IN BIT 'SE or U3'
0	1	1		INCREASE IN BIT 'ST or U4'
1	0	0		INCREASE IN BIT 'MN or U5'
1	0	1		INCREASE IN BIT 'MT or U6'
1	1	0		INCREASE IN BIT 'HR or U7'
1	1	1		INCREASE IN BIT 'HT or U8'

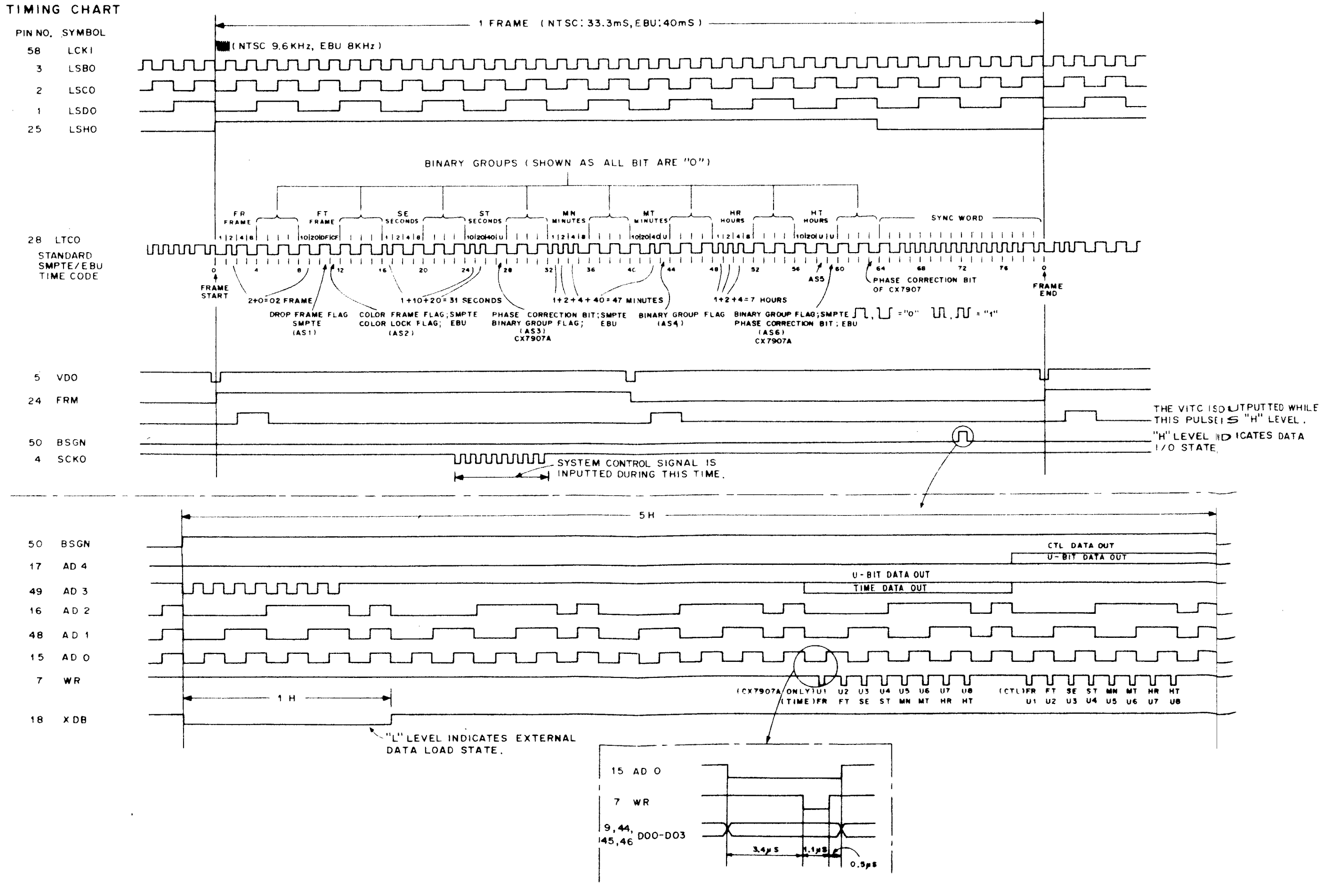
NOTE;INFLUENCED BIT IS DECIDED BY FIRST 2 BITS OF SWCI.

#34 SWMI

LSDO	LSCO	LSBO	SWMI	FUNCTION
0	0	0	x	INSERT SWMI DATA INTO BIT 'AS1'(NEGATIVE-LOGIC)
0	0	1	x	INSERT SWMI DATA INTO BIT 'AS2'(NEGATIVE-LOGIC)
0	1	0	x	INSERT SWMI DATA INTO BIT 'AS3'(NEGATIVE-LOGIC)
0	1	1	x	INSERT SWMI DATA INTO BIT 'AS4'(NEGATIVE-LOGIC)
1	0	0	x	INSERT SWMI DATA INTO BIT 'AS5'(NEGATIVE-LOGIC)
1	0	1	x	INSERT SWMI DATA INTO BIT 'AS6'(NEGATIVE-LOGIC)
1	1	0	∫	COLOR FRAME LOCK IN FIELD 1
1	1	1	0	COLOR FRAME OFF
1	1	1	1	COLOR FRAME ON

X;DON'T CARE.

TIMING CHART



#62 SWSI

LSDO	LSCO	LSBO	SWSI	FUNCTION
0	0	0	FBS1*	VITC FIELD MARK/ LTC PHASE CORRECTION POSITION SELECT
0	0	1	FBS2*	
0	1	0	FBS3*	
0	1	1	0	PHASE CORRECTION ON
0	1	1	1	PHASE CORRECTION OFF
1	0	0	S1**	SIGNAL FORMAT SELECT
1	0	1	S2**	
1	1	0	S4**	
1	1	1	x	–

x;DON'T CARE.

*;VITC FIELD MARK/LTC PHASE CORRECTION POSITION SELECT

FBS3	FBS2	FBS1	FIELD MARK POSITION	LTC BIT No.
0	0	0	AS1	10
0	0	1	AS2	11
0	1	0	AS3	27
0	1	1	AS4	43
1	0	0	AS5	58
1	0	1	AS6	59
1	1	0	–	–
1	1	1	–	–

NOTE;LTC PHASE CORRECTION BIT OF CX7907 IS FIXED ON BIT-63.

**;SIGNAL FORMAT SELECT

S4	S2	S1	FORMAT	FRAME
0	0	0	FILM	24
0	0	1	NOT ALLOWED	–
0	1	x		
1	0	0	PAL,SECAM	25
1	0	1	NOT ALLOWED	–
1	1	0	NTSC NDF	30
1	1	1	NTSC DF	30

DF;DROP FRAME
NDF;NON DROP FRAME
x;DON'T CARE.

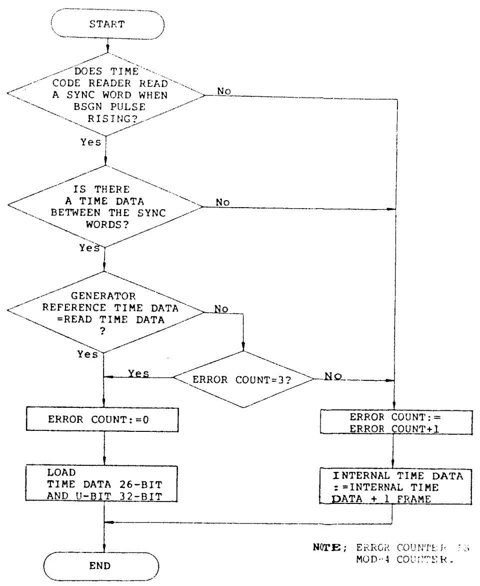
0;LOW LEVEL
1;HIGH LEVEL

#63 SWCI

LSDO	LSCO	LSBO	SWCI	FUNCTION	
0	0	0	0	U-BIT	IN/OUT DATA SELECT*1
0	0	0	1	TIME	
0	0	1	0	CTL	
0	0	1	1	TIME/U-BIT	
0	1	0	x	–	
0	1	1	0	DATA RESET ON*2	
0	1	1	1	DATA RESET OFF	
1	0	0	0	TIME DATA HOLD	
1	0	0	1	TIME DATA RUN	
1	0	1	↑	EXTERNAL DATA LOAD*2	
1	1	0	0	EXTRAPOLATION ON	
1	1	0	1	EXTRAPOLATION OFF	
1	1	1	x	–	

x; DON'T CARE.
*1;REFER TO TIMING CHART(DATA OUT).
*2;INFLUENCED DATA IS DECIDED BY FIRST 2 BITS OF SWCI.

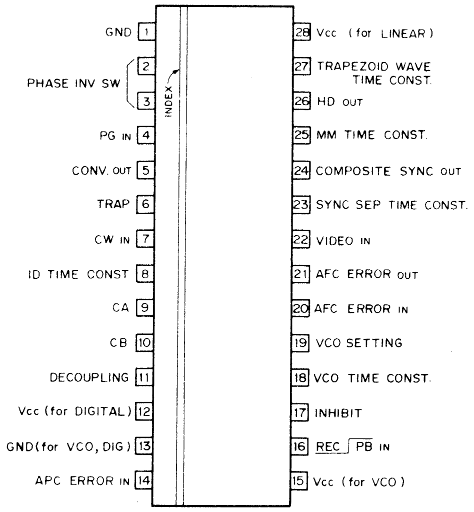
ERROR BYPASS ALGORITHM

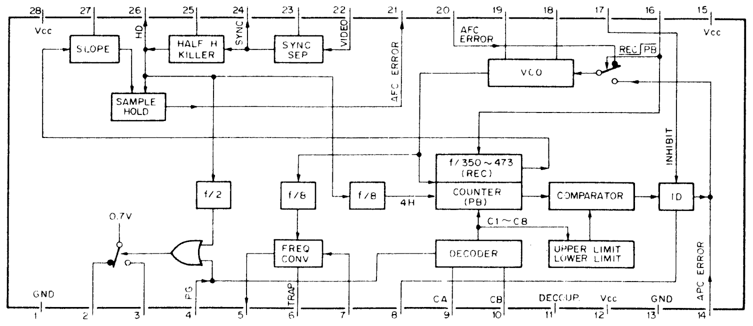


START
DOES TIME CODE READER READ A SYNC WORD WHEN BSGN PULSE RISING?
No
Yes
IS THERE A TIME DATA BETWEEN THE SYNC WORDS?
No
Yes
GENERATOR REFERENCE TIME DATA =READ TIME DATA ?
No
Yes
ERROR COUNT=3?
Yes
No
ERROR COUNT:=0
LOAD TIME DATA 26-BIT AND U-BIT 32-BIT
ERROR COUNT:= ERROR COUNT+1
INTERNAL TIME DATA :=INTERNAL TIME DATA + 1 FRAME
END

NOTE; ERROR COUNTER IS MOD-4 COUNTER.

CX 859 (SONY)
— TOP VIEW —





DECODER TRUTH TABLE

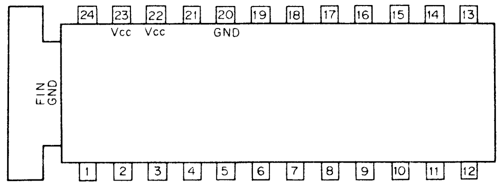
CA \ CB	LOW	OPEN	HIGH
LOW	C1	C7	—
OPEN	C4	C5	C6
HIGH	—	*C2 C3	C8

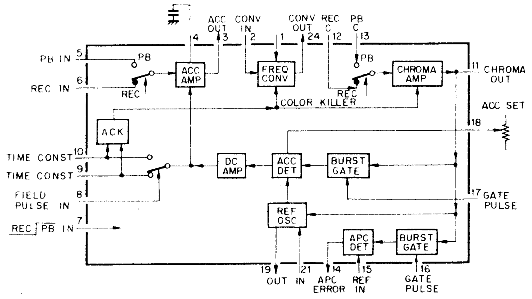
* PG : L --- C2
PG : H --- C3

AFC/APC PRESET DATA

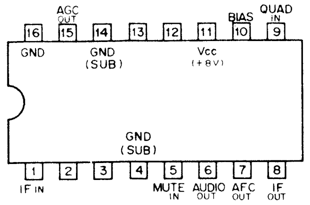
	AFC COUNT DOWN	APC ID COUNT	
		UPPER LIM.	LOWER LIM.
C1	f/473	105	95
C2	f/351	129	119
C3	f/353	137	127
C4	f/351	118	104
C5	f/351	131	117
C6	f/351	144	130
C7	f/350	136	104
C8	———	125	115

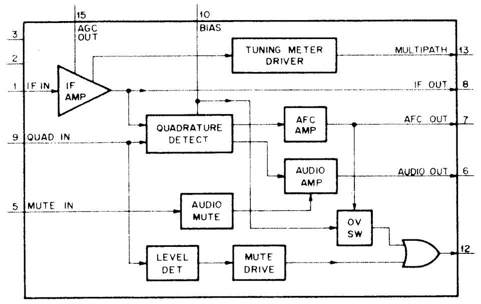
CX872 (SONY)
— TOP VIEW —



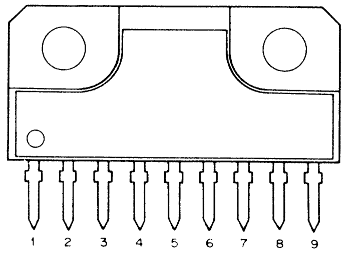


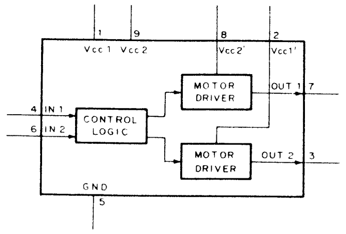
HA12411 (HITACHI)
FM IF AMPLIFIER
QUADRATURE DETECT
AUDIO AMPLIFIER
MUTING
AFC
AGC
TUNING METER DRIVER





M54543L (MITSUBISHI)
BI-DIRECTIONAL MOTOR DRIVER
— SIDE VIEW —

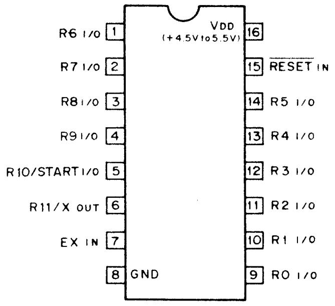


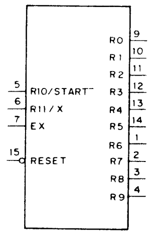


IN		OUT		MODE
1	2	1	2	
0	0	Z	Z	NO OPERATION
1	0	1	0	ROTATION
0	1	0	1	REVERSE ROTATION
1	1	0	0	BRAKE

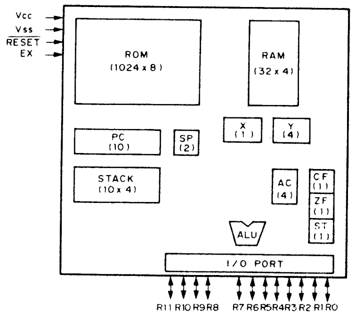
0 : LOW LEVEL
1 : HIGH LEVEL
Z : HIGH IMPEDANCE

MB88201-173N (FUJITSU)
C-MOS 4 BIT MICROCOMPUTER
— TOP VIEW —

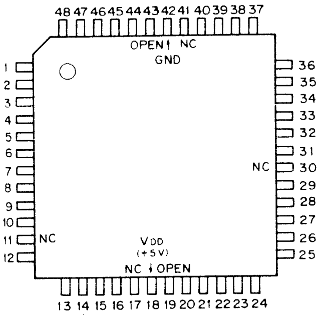


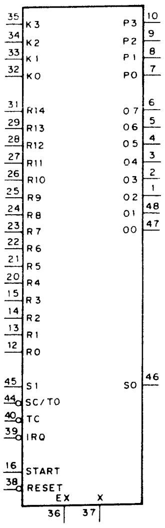


EX	; EXTERNAL X'TAL IN
R0-R11	; I/O PORT(R) IN/OUT
RESET	; RESET IN
START	; STANDBY RELEASE IN
R11/X	; EXT CLOCK IN/INT CLOCK OUT

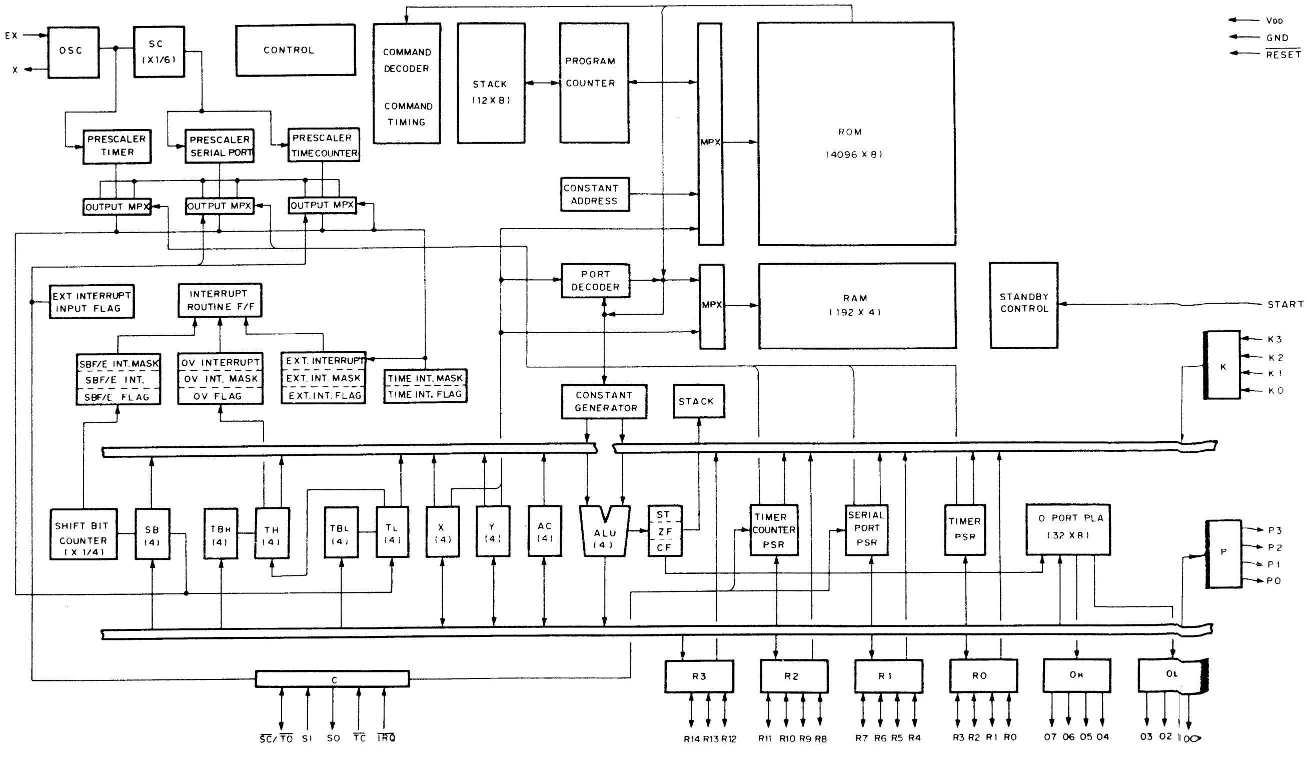


MB88501-247M (FUJITSU) FLAT PACKAGE
MB88501-255M (FUJITSU) FLAT PACKAGE
MB88501-256M (FUJITSU) FLAT PACKAGE
C-MOS 4-BIT MICROCOMPUTER
— TOP VIEW —

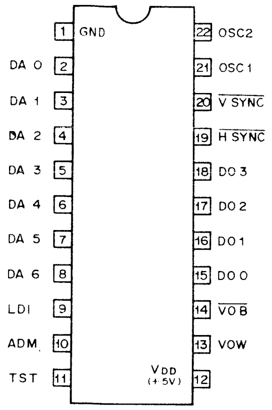


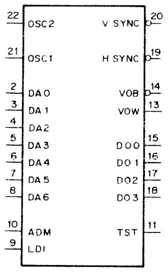


EX ; EXTERNAL CLOCK IN
$\overline{\text{IRQ}}$; INTERRUPT REQUEST IN
KO-K3 ; 4-BIT PARALLEL IN
OO-O7 ; PARALLEL OUT/8-BIT PLA OUT
PO-P3 ; 4-BIT PARALLEL OUT
RO-R14 ; DATA IN/OUT
$\overline{\text{RESET}}$; RESET IN
$\overline{\text{SC}}/\overline{\text{TO}}$; SHIFT CLOCK IN/INT TIMING OUT
SI ; SERIAL DATA IN
SO ; SERIAL DATA OUT
START ; STANDBY OFF IN
X ; CLOCK OUT



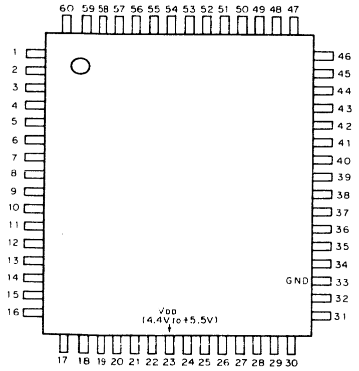
MN1237AD (MATSUSHITA)
C-MOS INDICATES DATA OF 60 CHARACTERS CRT INTERFACE
— TOP VIEW —



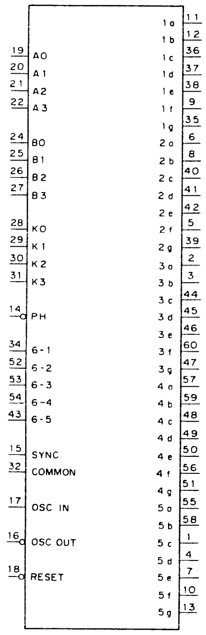


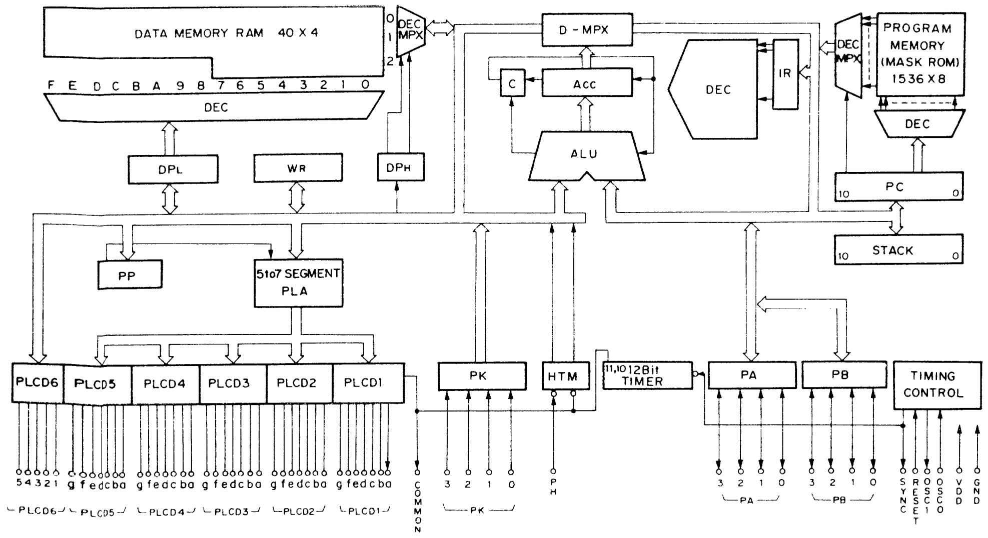
ADM ; ADDRESS MODE SELECT IN
DA0~DA6 ; DATA BUS INPUT
DO0~DO3 ; GENERAL OUTPUT
H SYNC ; H SYNC INPUT
LDI ; STROBE PULSE INPUT
OSC1,2 ; OSC
TST ; TEST
VOB ; BACKGROUND OUTPUT
VOW ; CHARACTERS OUTPUT
V SYNC ; V SYNC INPUT

MSM58421-74GSK (OKI) FLAT PACKAGE
C-MOS 4-BIT MICROCOMPUTER WITH LCD DRIVER
— TOP VIEW —

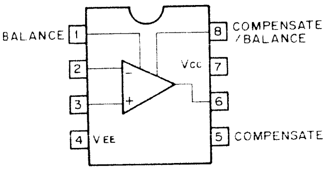


1a ~ 1g ; LCD 1 DIGHT a to g DRIVE OUT
2a ~ 2g ; LCD 2 DIGHT a to g DRIVE OUT
3a ~ 3g ; LCD 3 DIGHT a to g DRIVE OUT
4a ~ 4g ; LCD 4 DIGHT a to g DRIVE OUT
5a ~ 5g ; LCD 5 DIGHT a to g DRIVE OUT
6-1 ~ 6-5 ; LCD 6-1 to 6-5 DRIVE OUT
A0 ~ A3 ; PORT A0 to PORT A3 I/O
B0 ~ B3 ; PORT B0 to PORT B3 I/O
K0 ~ K3 ; PORT K0 to PORT K3 IN
PH ; PORT H IN
COMMON ; LCD COMMON OUT
SYNC ; SYNC OUT
OSC IN ; OSC IN
OSC OUT ; OSC OUT
RESET ; RESET IN

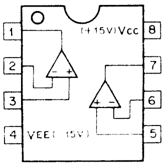




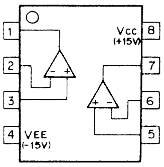
NE5534P (TI)
OPERATIONAL AMPLIFIER
— TOP VIEW —



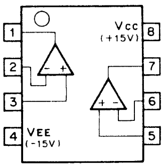
NJM4558M (JRC) FLAT PACKAGE
OPERATIONAL AMPLIFIER
— TOP VIEW —



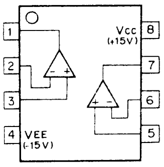
NJM2041M-D (JRC) FLAT PACKAGE
OPERATIONAL AMPLIFIER
— TOP VIEW —



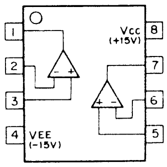
NJM4560M (JRC) FLAT PACKAGE
OPERATIONAL AMPLIFIER
— TOP VIEW —



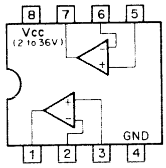
NJM2043D-D (JRC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



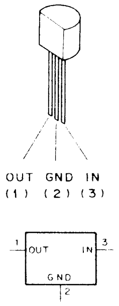
NJM4562D-D (JRC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



NJM2903D (JRC)
NJM2903M (JRC) FLAT PACKAGE
VOLTAGE COMPARATOR
— TOP VIEW —

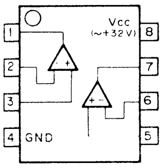


NJM78L??A (JRC)
POSITIVE VOLTAGE REGULATOR (40mA)

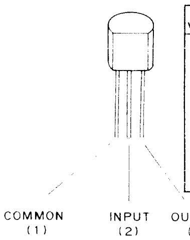


2V	NJM78L02A
5V	NJM78L05A
6V	NJM78L06A
8V	NJM78L08A
9V	NJM78L09A
12V	NJM78L12A
15V	NJM78L15A

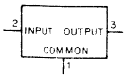
NJM4556D (JRC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



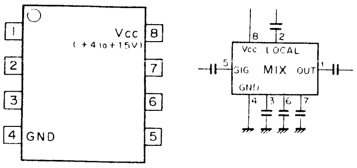
NJM79L ? ?A (JRC)
NEGATIVE VOLTAGE REGULATOR (100mA)
— FRONT VIEW —



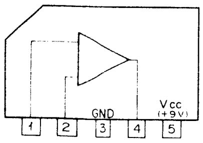
OUTPUT VOLTAGE	? ?
− 3V	NJM79L03A
− 5V	NJM79L05A
− 6V	NJM79L06A
− 8V	NJM79L08A
− 9V	NJM79L09A
−12V	NJM79L12A
−15V	NJM79L15A
−18V	NJM79L18A
−24V	NJM79L24A



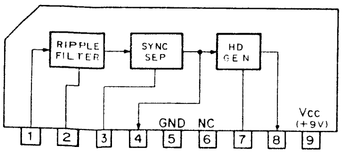
SN16913P (TI)
BALANCED MIXER
— TOP VIEW —



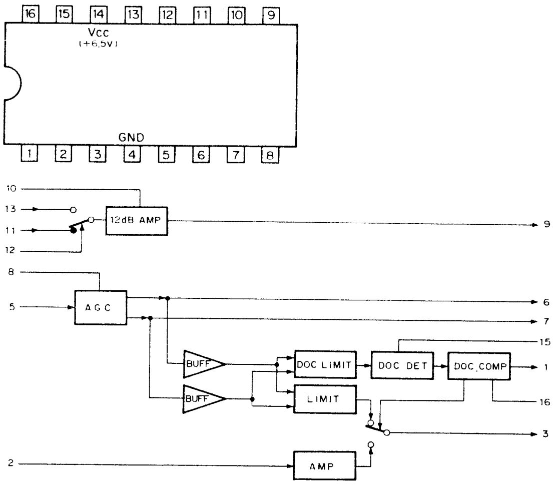
TA7060P (TOSHIBA)
LINEAR AMP
— SIDE VIEW —



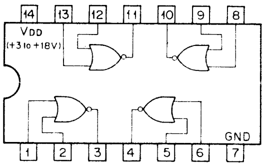
TA7357AP (TOSHIBA)
SYNC SEPARATOR/HD PULSE GENERATOR
— SIDE VIEW —

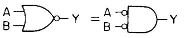


TA7672P (TOSHIBA)
PB RF PROCESSOR
— TOP VIEW —



TC4001BF (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT NOR GATE
— TOP VIEW —



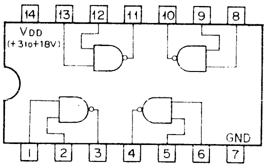


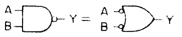
$Y = \overline{A+B} = \overline{A} \cdot \overline{B}$

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

TC4011BF (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



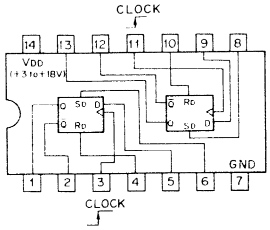


$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

TC4013BF (TOSHIBA) FLAT PACKAGE
TC504013BF (TOSHIBA) FLAT PACKAGE
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET
— TOP VIEW —



DIRECT R-S FLIP FLOP

SD	RD	Q	Q̄
0	0	Qn	Q̄n
0	1	0	1
1	0	1	0
1	1	0	1

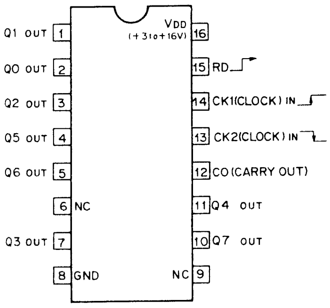
D-TYPE FLIP FLOP

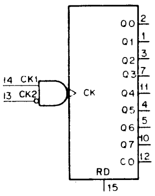
CKn	CKn+1
D	Q
0	0
1	1

CLOCK CK; ↑
CKn; BEFORE CLOCK
CKn+1; AFTER CLOCK

0; LOW LEVEL
1; HIGH LEVEL

TC4022BP (TOSHIBA)
C-MOS OCTAL COUNTER/DIVIDER
— TOP VIEW —

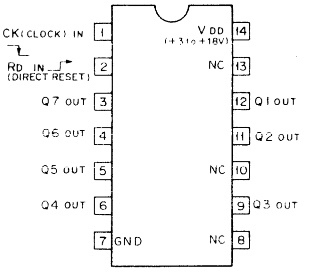


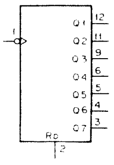


COUNT	INPUTS		OUTPUTS								
	RD	CK=CK1·$\overline{CK2}$	Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0	CO
0	1	X	0	0	0	0	0	0	0	1	1
0	0	↑	0	0	0	0	0	0	0	1	1
1	0	↑	0	0	0	0	0	0	1	0	1
2	0	↑	0	0	0	0	0	1	0	0	1
3	0	↑	0	0	0	0	1	0	0	0	1
4	0	↑	0	0	0	1	0	0	0	0	0
5	0	↑	0	0	1	0	0	0	0	0	0
6	0	↑	0	1	0	0	0	0	0	0	0
7	0	↑	1	0	0	0	0	0	0	0	0
NO COUNT	0	1	NO CHANGE								
	0	0									

1: HIGH
0: LOW
X: DON'T CARE

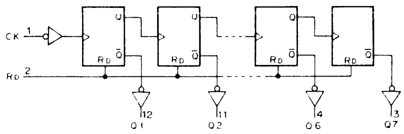
TC4024BF (TOSHIBA) FLAT PACKAGE
C-MOS ASYNCHRONOUS 7-BIT BINARY COUNTER
— TOP VIEW —



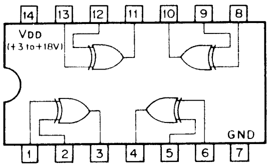


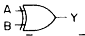
COUNT	INPUTS		OUTPUTS						
	CK	RD	Q7	Q6	Q5	Q4	Q3	Q2	Q1
0	X	1	0	0	0	0	0	0	0
1	↓	0	0	0	0	0	0	0	1
2	↓	0	0	0	0	0	0	1	0
3	↓	0	0	0	0	0	0	1	1
4	↓	0	0	0	0	0	1	0	0
125	↓	0	1	1	1	1	1	0	1
126	↓	0	1	1	1	1	1	1	0
127	↓	0	1	1	1	1	1	1	1
—	0	0	NO CHANGE						
—	1	0							

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE



TC4030BF (TOSHIBA) FLAT PACKAGE
C-MOS EXCLUSIVE OR GATE
— TOP VIEW —



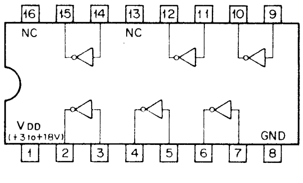


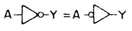
$Y = \overline{A} \cdot B + A \cdot \overline{B}$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

0: LOW LEVEL
1: HIGH LEVEL

TC4049BF (TOSHIBA) FLAT PACKAGE
C-MOS INVERTING TYPE BUFFER/CONVERTER
— TOP VIEW —





$Y = \overline{A}$

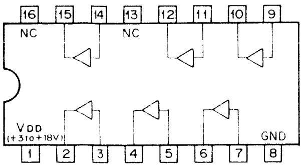
A	Y
0	1
1	0

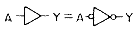
0; LOW LEVEL
1; HIGH LEVEL

TC4050BF (TOSHIBA) FLAT PACKAGE

C-MOS NON-INVERTING TYPE BUFFER/CONVERTER

— TOP VIEW —





Y = A

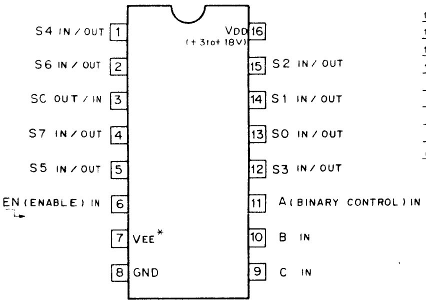
A	Y
0	0
1	1

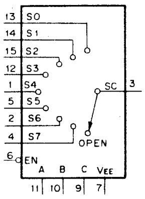
0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4051BF (TOSHIBA) FLAT PACKAGE

C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER

— TOP VIEW —





VEE* ; VDD − VEE = +3 to +18V

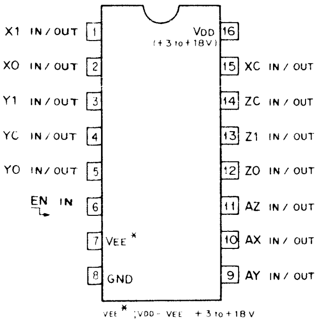
EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

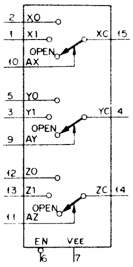
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC4053BF (TOSHIBA) FLAT PACKAGE

C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER

— TOP VIEW —





VEE* ; VDD − VEE +3 to +18V

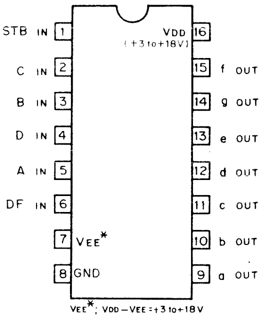
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

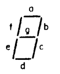
CONT. INPUTS		ON CHANNEL
EN	A (X,Y,Z,)	
0	0	0
0	1	1
1	X	OPEN

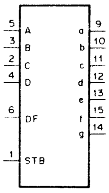
TC4056BF (TOSHIBA) FLAT PACKAGE

C-MOS BCD TO 7-SEGMENT DECODER/LIQUID-CRYSTAL DISPLAY DRIVERS WITH STROBED-LATCH FUNCTION

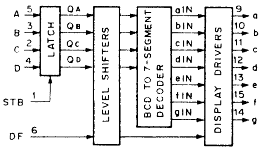
— TOP VIEW —







VEE* ; VDD − VEE = +3 to +18V
DF ; DISPLAY FREQUENCY
STB ; STROBE



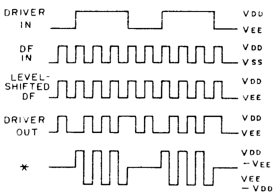
INPUT				OUTPUT							DISPLAY	DECIMAL
D	C	B	A	a	b	c	d	e	f	g		
0	0	0	0	1	1	1	1	1	1	0	0	0
0	0	0	1	0	1	1	0	0	0	0	1	1
0	0	1	0	1	1	0	1	1	0	1	2	2
0	0	1	1	1	1	1	1	0	0	1	3	3
0	1	0	0	0	1	1	0	0	1	1	4	4
0	1	0	1	1	0	1	1	0	1	1	5	5
0	1	1	0	1	0	1	1	1	1	1	6	6
0	1	1	1	1	1	1	0	0	0	0	7	7
1	0	0	0	1	1	1	1	1	1	1	8	8
1	0	0	1	1	1	1	1	0	1	1	9	9
1	0	1	0	0	0	0	1	1	1	0	L	10
1	0	1	1	0	1	1	0	1	1	1	H	11
1	1	0	0	1	1	0	0	1	1	1	P	12
1	1	0	1	1	1	1	0	1	1	1	A	13
1	1	1	0	0	0	0	0	0	0	1	—	14
1	1	1	1	0	0	0	0	0	0	0	BLANK	15

FUNCTION TABLE

STB	INPUT (A,B,C,D)	LATCH OUTPUT (Q_A, Q_B, Q_C, Q_D)
1	1	1
1	0	0
0	X	Qo

X ; DON'T CARE
Qo ; THE LEVEL OF Q_N BEFORE THE HIGH TO LOW TRANSITION OF STROBE.

TIMING CHART

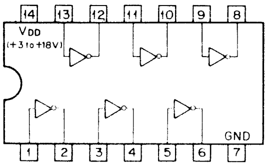


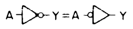
* RESULTANT LIQUID-CRYSTAL SEGMENT WAVEFORM IF LEVEL-SHIFTED DF IS APPLIED TO LIQUID-CRYSTAL COMMON LINE.

TC4069UBF (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER

— TOP VIEW —





Y = $\overline{A}$

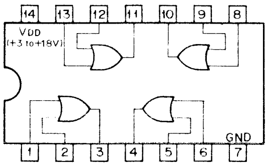
A	Y
0	1
1	0

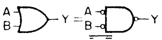
0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4071BF (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT OR GATE

— TOP VIEW —





Y = A + B = $\overline{\overline{A}\cdot\overline{B}}$

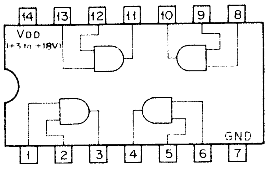
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

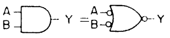
0 : LOW LEVEL
1 : HIGH LEVEL

TC4081BF (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT AND GATE

— TOP VIEW —





$Y = A \cdot B = \overline{\bar{A} + \bar{B}}$

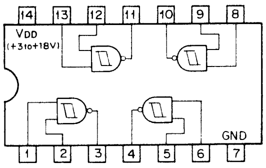
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

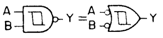
0;LOW LEVEL
1;HIGH LEVEL

TC4093BF (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NAND SCHMITT TRIGGER

— TOP VIEW —

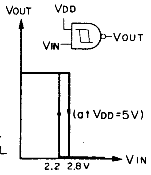




$Y = \overline{A \cdot B} = \bar{A} + \bar{B}$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

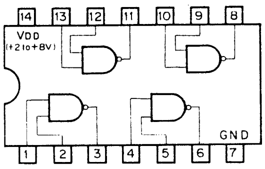
0; LOW LEVEL
1 ; HIGH LEVEL

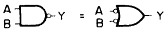


TC40H000F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NAND GATE

— TOP VIEW —





$Y = \overline{A \cdot B} = \bar{A} + \bar{B}$

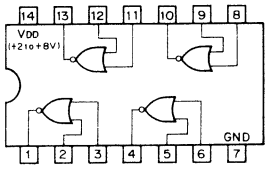
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

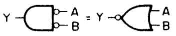
0; LOW LEVEL
1 ; HIGH LEVEL

TC40H002F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NOR GATE

— TOP VIEW —





$Y = \overline{A + B}$

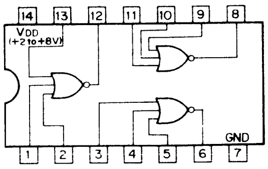
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

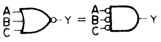
0:LOW LEVEL
1:HIGH LEVEL

TC40H027F (TOSHIBA) FLAT PACKAGE

C-MOS 3-INPUT POSITIVE-NOR GATE

— TOP VIEW —





$Y = \overline{A + B + C} = \bar{A} \cdot \bar{B} \cdot \bar{C}$

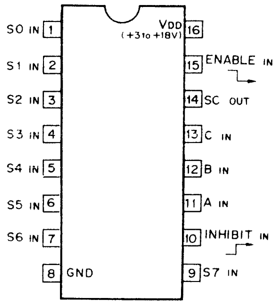
A	B	C	Y
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

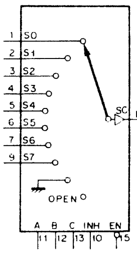
0;LOW LEVEL
1 ;HIGH LEVEL

TC4512BF (TOSHIBA) FLAT PACKAGE

C-MOS 8-CHANNEL DATA SELECTOR/MULTIPLEXER

— TOP VIEW —





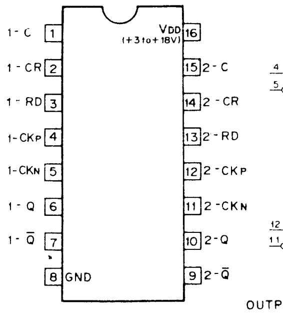
CONTROL INPUTS					OUTPUT
EN	INH	C	B	A	SC
0	0	0	0	0	S0
0	0	0	0	1	S1
0	0	0	1	0	S2
0	0	0	1	1	S3
0	0	1	0	0	S4
0	0	1	0	1	S5
0	0	1	1	0	S6
0	0	1	1	1	S7
0	1	X	X	X	GND
1	X	X	X	X	OPEN

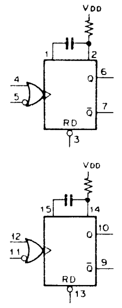
0;LOW LEVEL
1;HIGH LEVEL
X;DON'T CARE

TC4538BF (TOSHIBA) FLAT PACKAGE

C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE
MONOSTABLE MULTIVIBRATOR

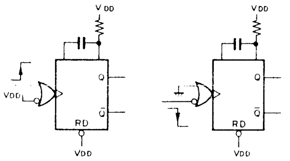
— TOP VIEW —



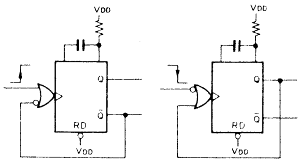


OUTPUT PULSE WIDTH=CR

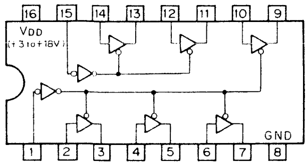
RETRIGGERABLE M.M.V

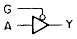


NON-RETRIGGERABLE M.M.V



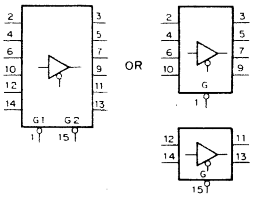
TC5012BF (TOSHIBA) FLAT PACKAGE
C-MOS NON-INVERTING 3-STATE BUFFER
— TOP VIEW —



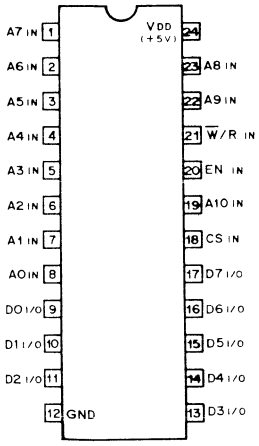


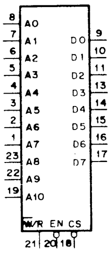
G	A	Y
0	0	0
0	1	1
1	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE



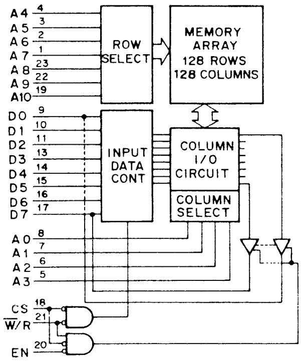
TC5517AF (TOSHIBA) (ACCESS TIME = 250 nS) FLAT PACKAGE
TC5517AF-2 (TOSHIBA) (ACCESS TIME = 250 nS) FLAT PACKAGE
TC5517AFL-2 (TOSHIBA) (ACCESS TIME = 250 nS) FLAT PACKAGE
C-MOS 16384(2048x8)-BIT HIGH SPEED STATIC RAM
— TOP VIEW —





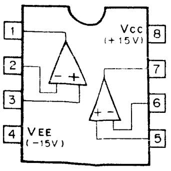
INPUTS			FUNCTION
CS	W/R	EN	
0	0	X	WRITE
0	1	0	READ
0	1	1	DISABLE (OUTPUT=HI-Z)
1	X	X	DISABLE (OUTPUT=HI-Z)

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

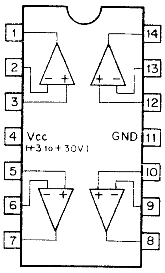


A0 - A10 ; ADDRESS INPUTS
W/R ; WRITE/READ ENABLE
EN ; OUTPUT ENABLE
CS ; CHIP SELECT
D0 - D7 ; DATA INPUTS/OUTPUTS

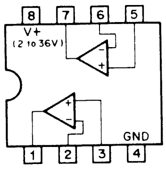
TL082CP (TI)
TL082CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET-INPUT)
— TOP VIEW — TL082CP



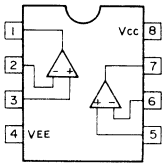
uPC324G2 (NEC) FLAT PACKAGE
QUAD. OP AMPLIFIER
— TOP VIEW —



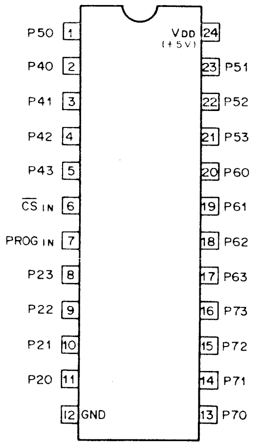
uPC393G2 (NEC) FLAT PACKAGE
VOLTAGE COMPARATOR
— TOP VIEW —

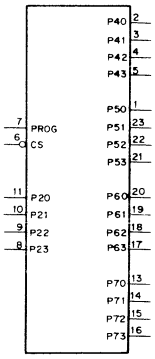


uPC4558C (NEC)
uPC4558G2 (NEC) FLAT PACKAGE
OPERATIONAL AMPLIFIER
— TOP VIEW —



uPD82C43G (NEC) FLAT PACKAGE
C-MOS I/O PORT EXPANDER
— TOP VIEW —



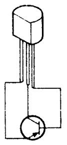


CONTROL AND PORT ADDRESSING

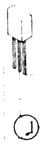
P23	P22	P21	P20	PORT	CONTROL
0	0	0	0	4	READ
0	0	0	1	5	
0	0	1	0	6	
0	0	1	1	7	
0	1	0	0	4	WRITE
0	1	0	1	5	
0	1	1	0	6	
0	1	1	1	7	
1	0	0	0	4	OR
1	0	0	1	5	
1	0	1	0	6	
1	0	1	1	7	
1	1	0	0	4	AND
1	1	0	1	5	
1	1	1	0	6	
1	1	1	1	7	

PROG ; PROGRAM PULSE INPUT
CS ; CHIP SELECT INPUT
P20~P23 ; I/O PORT 2 (FOR CPU)
P40~P43 ; I/O PORT 4
P50~P53 ; I/O PORT 5
P60~P63 ; I/O PORT 6
P70~P73 ; I/O PORT 7

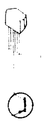
TRANSISTOR, DIODE, OTHER



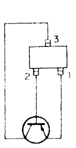
2SA1005



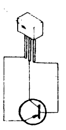
2SA1026
2SA1027R



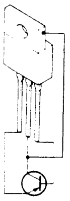
2SA1115



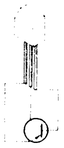
2SA1162
2SA1226
2SA812



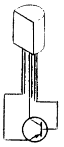
2SA1175



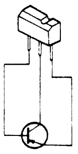
2SB825
2SB856
2SB553



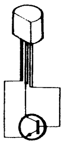
2SB733



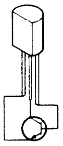
2SB739



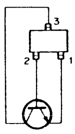
2SB822



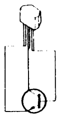
2SC1318
2SC1364
2SC1633
2SC1634
2SC2878



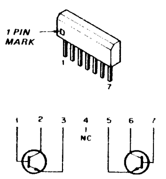
2SC1475
2SD789



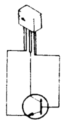
2SC1623
2SC2712
2SC2757
2SD1030



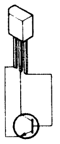
2SC1740S
2SC403SP



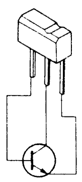
2SC2725



2SC2785



2SC633A
2SC634A



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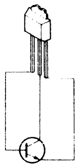
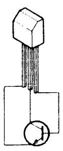
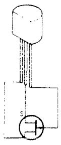


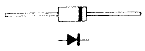
2SD1160
2SD1221



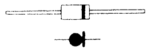
2SD774



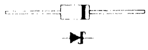
2SK152



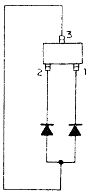
10E-1
10E-2
1S1555
1S1555S



10YD ? ?



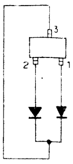
1S1925P
1SS99
ERA81-004
ERB81-004



1S2835

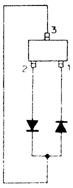
TRANSISTOR, DIODE, OTHER

TOP VIEW (SCALE 4/1)



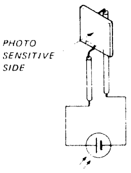
1S2837

TOP VIEW (SCALE 4/1)

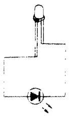


1SS123

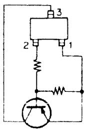
(SCALE 2/1)



55M-22LS

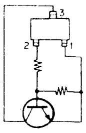


BR5505S

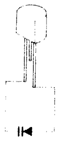


DTA114YK
DTA144EK

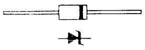
TOP VIEW (SCALE 4/1)



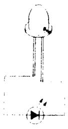
DTC114EK
DTC114YK
DTC144EK



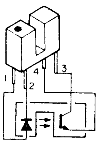
FC54M



HZ7B1L
RD ? ?E
RD ? ?EB
RD ? ?EL 1
RD ? ?EL 2
RD ? ?EL 3



KL-1



TLP801A

The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

SECTION 15
SCHEMATIC DIAGRAMS

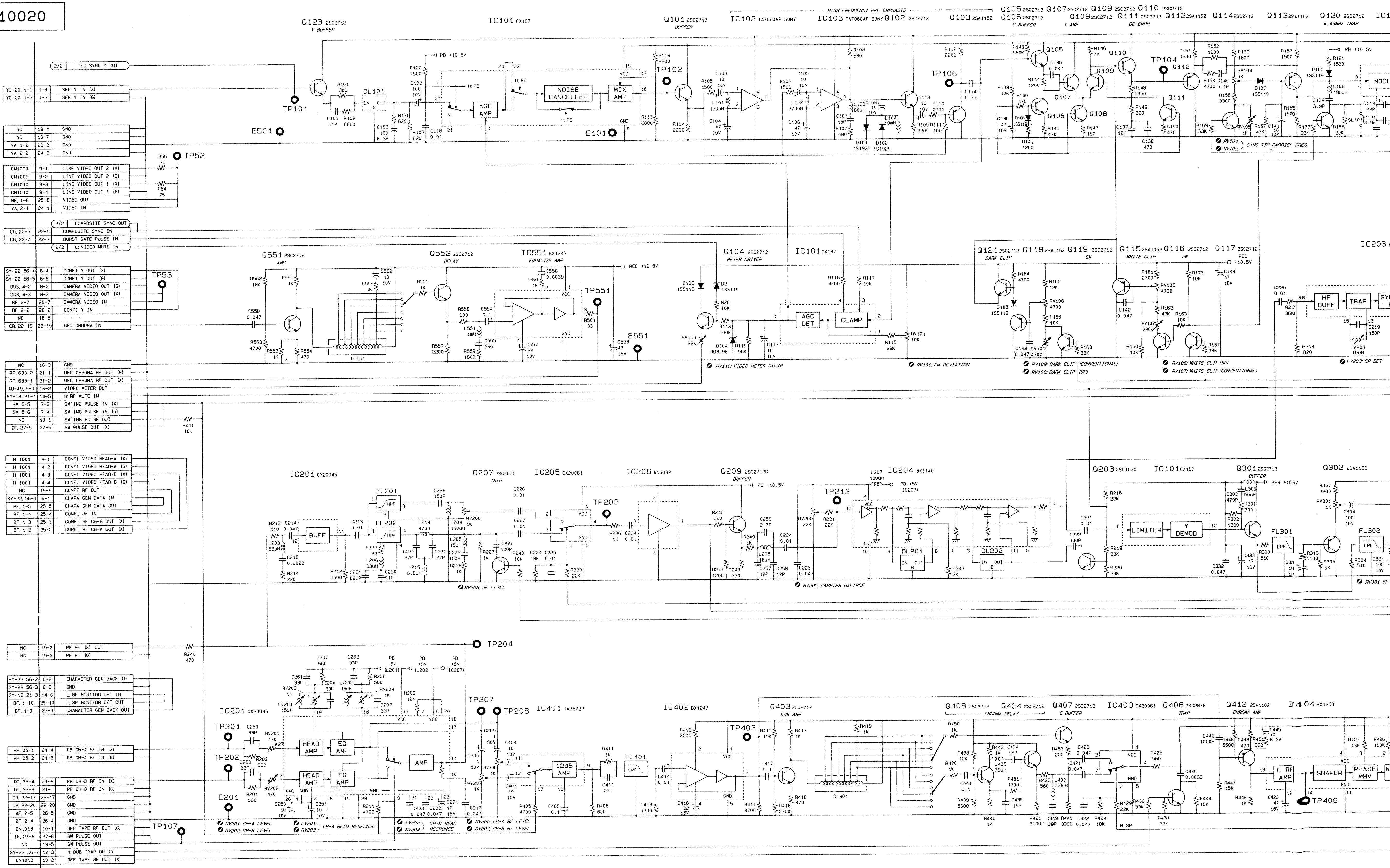
CIRCUIT FUNCTION OF THE SCHEMATIC DIAGRAMS

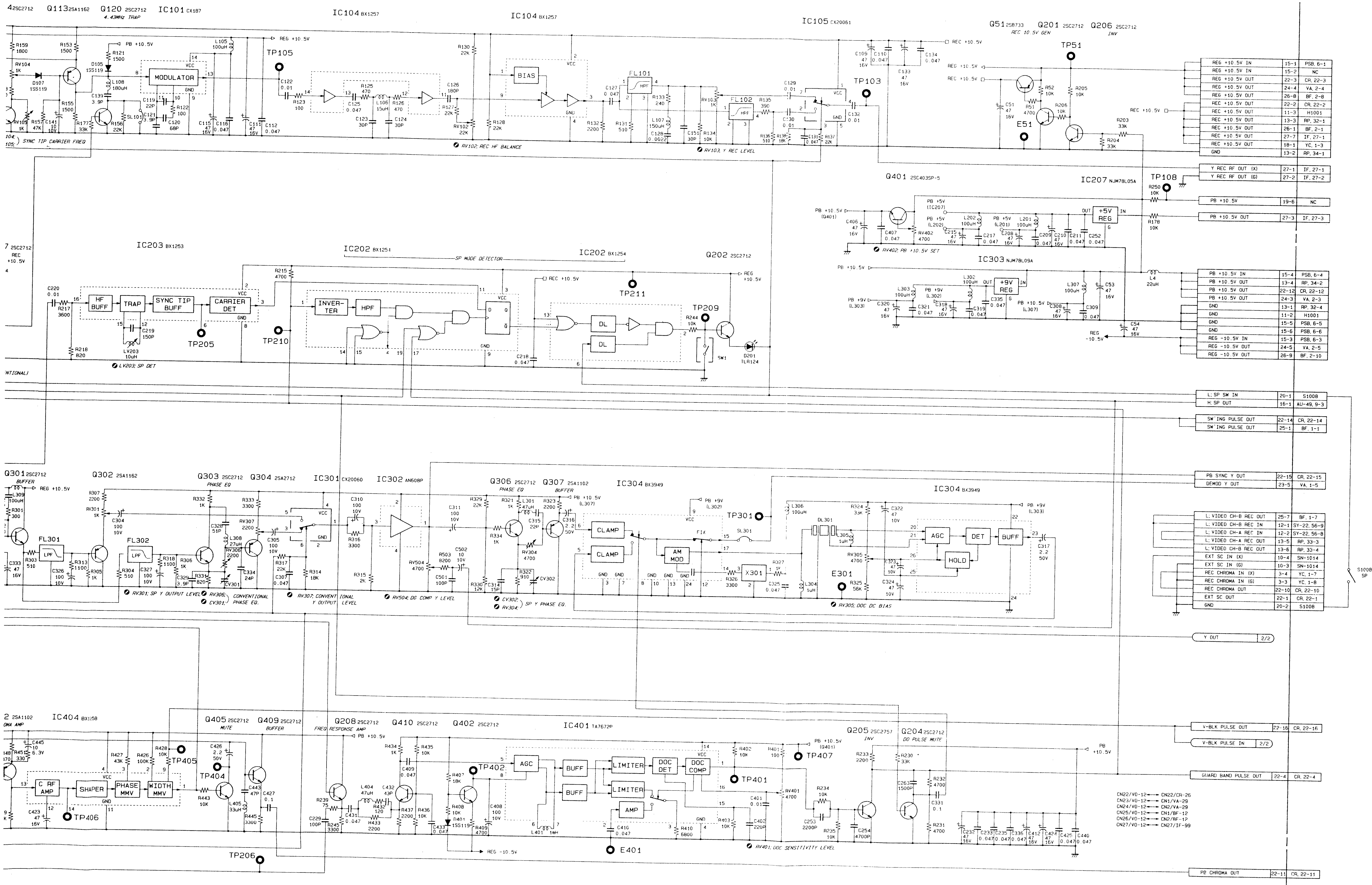
The circuit information is provided below.

SYSTEM	CIRCUIT BOARD	CIRCUIT FUNCTION
VIDEO	VO-12	. Y MOD/Demodulator
	IF-99	. RF Check board
	BF-12	. View Finder
	YC-20	. Y/C Separator
	CR-26	. Chroma MOD/Demodulator
	VA-29	. Y/C Mix, Video Output
	RP-24	. Video REC/PB Amplifier
AUDIO	AU-49A	. Audio REC/PB Amplifier
	DUS-69	
	DUS-6	. Tracking VR
	AU-64	. Audio CH-1 Dolby
	AU-65	. Audio CH-2 Dolby
	DUS-94	. VAR,Inductor
	DU-58	. Audio R/P/Erase, CTL Head
	AU-51A	. BIAS/Erase OSC, REC/PB Control
	DUS-3	. VAR,Inductor
	CM-19A	. Camera/MIC Input Select
	DUS-70	. Camera Input
	SWB-4	. Audio Level/Meter Select
SERVO	SV-57C	. Drum/Capstan/Reel Servo
	PC-22	. S/T-Reel FG Gen.
POWER	PSB-4	. Power Supply/Time Code REC Amplifier
	TM-19	. Hours Meter
	CN-26	. DC In Connector
	CN-100	. Backup Capacitor
KEY	KY-68	. Function Key/Display
	PA-48	. Time Code PB Amplifier
SYSTEM CONTROL	SY-18C	. System Control
	DUS-33	. VAR,Inductor
	DUS-5	. Solar Battery
	LE-20	. LED For Tape Begin/End DET
	LE-21	. LED For Tape Begin/End DET
	SY-22A	. System Control
	DUS-4	. Tenreg SW
	SY-23	. Solenoid Driver

VO-12 (1/2) (Y MOD/DEMODULATOR)

S/N; UP TO 10020

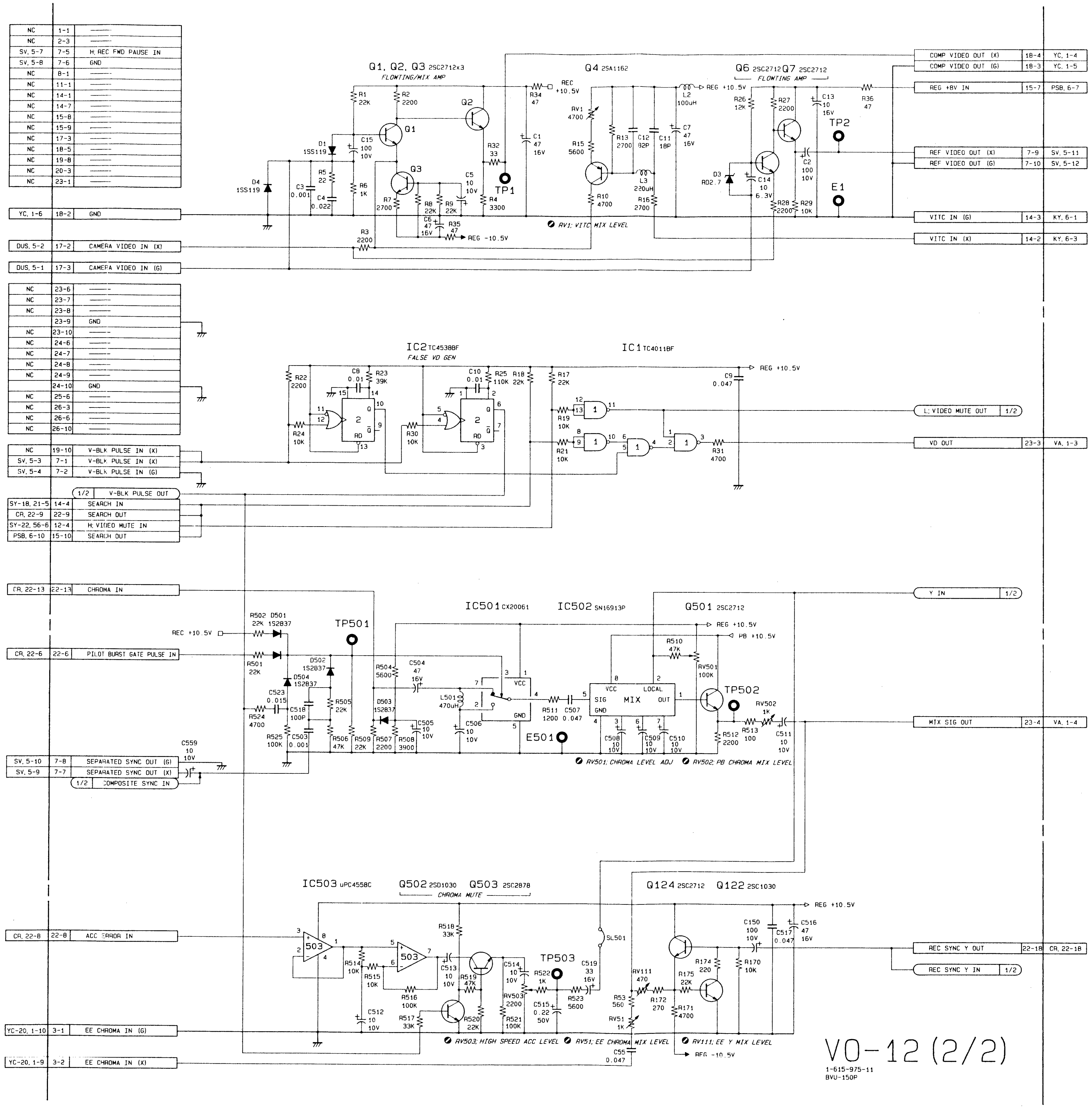

Q123 2SC2712 Y BUFFER
IC101 CX187
Q101 2SC2712 BUFFER
IC102 TA7060AP-SONY
IC103 TA7060AP-SONY
HIGH FREQUENCY PRE-EMPHASIS
Q102 2SC2712
Q103 2SA1162
Q105 2SC2712 Q106 2SC2712 Y BUFFER
Q107 2SC2712 Y AMP
Q108 2SC2712 Q109 2SC2712 Q110 2SC2712 Q111 2SC2712 DE-EMPH
Q112 2SA1162 Q114 2SC2712 Q113 2SA1162
Q120 2SC2712 4.43MHz TRAP
TP101 TP102 TP106 TP104 TP52 TP53 TP551 TP203 TP212 TP204 TP201 TP202 TP207 TP208 TP403 TP406 TP107
E501 E101 E551 E201
DL101
AGC AMP
NOISE CANCELLER
MIX AMP
H; PB
PB +10.5V
MODU
Ø RV104; Ø RV105; SYNC TIP CARRIER FREQ
YC-20, 1-1 1-3 SEP Y IN (X)
YC-20, 1-2 1-2 SEP Y IN (G)
2/2 REC SYNC Y OUT
NC 19-4 GND
NC 19-7 GND
VA, 1-2 23-2 GND
VA, 2-2 24-2 GND
CN1009 9-1 LINE VIDEO OUT 2 (X)
CN1009 9-2 LINE VIDEO OUT 2 (G)
CN1010 9-3 LINE VIDEO OUT 1 (X)
CN1010 9-4 LINE VIDEO OUT 1 (G)
BF, 1-8 25-8 VIDEO OUT
VA, 2-1 24-1 VIDEO IN
2/2 COMPOSITE SYNC OUT
CR, 22-5 22-5 COMPOSITE SYNC IN
CR, 22-7 22-7 BURST GATE PULSE IN
2/2 L; VIDEO MUTE IN
SY-22, 56-4 6-4 CONFI Y OUT (X)
SY-22, 56-5 6-5 CONFI Y OUT (G)
DUS, 4-2 8-2 CAMERA VIDEO OUT (G)
DUS, 4-3 8-3 CAMERA VIDEO OUT (X)
BF, 2-7 26-7 CAMERA VIDEO IN
BF, 2-2 26-2 CONFI Y IN
NC 18-5
CR, 22-19 22-19 REC CHROMA IN
Q551 2SC2712 AMP
Q552 2SC2712 DELAY
IC551 BX1247 EQUALIZE AMP
REC +10.5V
DL551
Q104 2SC2712 METER DRIVER
IC101 CX187
AGC DET
CLAMP
Ø RV110; VIDEO METER CALIB
Ø RV101; FM DEVIATION
Q121 2SC2712 DARK CLIP
Q118 2SA1162 Q119 2SC2712 SW
Q115 2SA1162 WHITE CLIP
Q116 2SC2712 SW
Q117 2SC2712
Ø RV109; DARK CLIP (CONVENTIONAL)
Ø RV108; DARK CLIP (SP)
Ø RV106; WHITE CLIP (SP)
Ø RV107; WHITE CLIP (CONVENTIONAL)
IC203
HF BUFF
TRAP
Ø LV203; SP DET
NC 16-3 GND
RP, 633-2 21-1 REC CHROMA RF OUT (G)
RP, 633-1 21-2 REC CHROMA RF OUT (X)
AU-49, 9-1 16-2 VIDEO METER OUT
SY-18, 21-4 14-5 H; RF MUTE IN
SV, 5-5 7-3 SW'ING PULSE IN (X)
SV, 5-6 7-4 SW'ING PULSE IN (G)
NC 19-1 SW'ING PULSE OUT
IF, 27-5 27-5 SW PULSE OUT (X)
H 1001 4-1 CONFI VIDEO HEAD-A (X)
H 1001 4-2 CONFI VIDEO HEAD-A (G)
H 1001 4-3 CONFI VIDEO HEAD-B (X)
H 1001 4-4 CONFI VIDEO HEAD-B (G)
NC 19-9 CONFI RF OUT
SY-22, 56-1 6-1 CHARA GEN DATA IN
BF, 1-5 25-5 CHARA GEN DATA OUT
BF, 1-4 25-4 CONFI RF IN
BF, 1-3 25-3 CONFI RF CH-B OUT (X)
BF, 1-2 25-2 CONFI RF CH-A OUT (X)
IC201 CX20045
BUFF
FL201 HPF
FL202 HPF
Q207 2SC403C TRAP
IC205 CX20061
IC206 AN608P
Q209 2SC2712G BUFFER
IC204 BX1140
PB +5V (IC207)
DL201
DL202
Ø RV208; SP LEVEL
Ø RV205; CARRIER BALANCE
Q203 2SD1030
IC101 CX187
LIMITER
Y DEMOD
Q301 2SC2712 BUFFER
REG +10.5V
Q302 2SA1162
FL301 LPF
FL302 LPF
Ø RV301; SP
NC 19-2 PB RF (X) OUT
NC 19-3 PB RF (G)
SY-22, 56-2 6-2 CHARACTER GEN BACK IN
SY-22, 56-3 6-3 GND
SY-18, 21-3 14-6 L; BP MONITOR DET IN
BF, 1-10 25-10 L; BP MONITOR DET OUT
BF, 1-9 25-9 CHARACTER GEN BACK OUT
IC201 CX20045
HEAD AMP
EQ AMP
AMP
IC401 TA7672P
12dB AMP
FL401 LPF
IC402 BX1247
Q403 2SC2712 6dB AMP
DL401
Q408 2SC2712 Q404 2SC2712 CHROMA DELAY
Q407 2SC2712 C BUFFER
IC403 CX20061
Q406 2SC2878 TRAP
Q412 2SA1102 CHROMA AMP
IC404 BX1258
C RF AMP
SHAPER
PHASE MMV
RP, 35-1 21-4 PB CH-A RF IN (X)
RP, 35-2 21-3 PB CH-A RF IN (G)
RP, 35-4 21-6 PB CH-B RF IN (X)
RP, 35-3 21-5 PB CH-B RF IN (G)
CR, 22-17 22-17 GND
CR, 22-20 22-20 GND
BF, 2-5 26-5 GND
BF, 2-4 26-4 GND
CN1013 10-1 OFF TAPE RF OUT (G)
IF, 27-8 27-8 SW PULSE OUT
NC 19-5 SW PULSE OUT
SY-22, 56-7 12-3 H; DUB TRAP ON IN
CN1013 10-2 OFF TAPE RF OUT (X)
Ø RV201; CH-A LEVEL
Ø RV202; CH-B LEVEL
Ø LV201, Ø RV203; CH-A HEAD RESPONSE
Ø LV202, Ø RV204; CH-B HEAD RESPONSE
Ø RV206; CH-A RF LEVEL
Ø RV207; CH-B RF LEVEL
H; SP

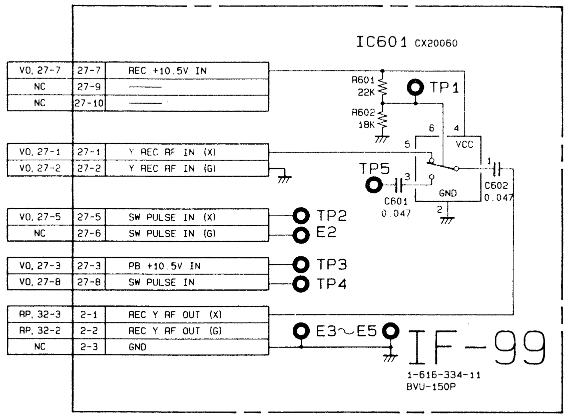

Q113 2SA1162
Q120 2SC2712
IC101 CX187
4.43MHz TRAP
MODULATOR
TP105
IC104 BX1257
BIAS
IC105 CX20061
FL101 HPF
FL102 HPF
TP103
Q51 2SB733
Q201 2SC2712
Q206 2SC2712
REC 10.5V GEN
INV
TP51
E51
SYNC TIP CARRIER FREQ
RV102: REC HF BALANCE
RV103: Y REC LEVEL
Q401 2SC403SP-5
IC207 NJM78L05A
+5V REG
TP108
IC303 NJM78L09A
+9V REG
RV402: PB +10.5V SET
IC203 BX1253
HF BUFF
TRAP
SYNC TIP BUFF
CARRIER DET
TP205
LV203: SP DET
IC202 BX1251
SP MODE DETECTOR
IC202 BX1254
INVERTER
HPF
DL
TP210
TP211
TP209
Q202 2SC2712
SW1
D201 TLR124
Q301 2SC2712 BUFFER
Q302 2SA1162
FL301 LPF
FL302 LPF
Q303 2SC2712
Q304 2SA1162
PHASE EQ
IC301 CX20060
IC302 AN608P
Q306 2SC2712 PHASE EQ
Q307 2SA1102 BUFFER
IC304 BX3949
CLAMP
AM MOD
X301
AGC
DET
BUFF
HOLD
TP301
E301
RV301: SP Y OUTPUT LEVEL
RV306: CONVENTIONAL PHASE EQ.
CV301
RV307: CONVENTIONAL Y OUTPUT LEVEL
RV504: DC COMP Y LEVEL
CV302: RV304: SP Y PHASE EQ.
RV305: DOC DC BIAS
IC404 BX1158
C RF AMP
SHAPER
PHASE MMV
WIDTH MMV
TP404
TP405
TP406
TP206
Q405 2SC2712 MUTE
Q409 2SC2712 BUFFER
Q208 2SC2712 FREQ RESPONSE AMP
Q410 2SC2712
Q402 2SC2712
IC401 TA7672P
AGC
BUFF
LIMITER
DOC DET
DOC COMP
AMP
TP402
TP401
TP407
E401
RV401: DOC SENSITIVITY LEVEL
Q205 2SC2757 INV
Q204 2SC2712 DO PULSE MUTE
REG +10.5V IN | 15-1 | PSB, 6-1
REG +10.5V IN | 15-2 | NC
REG +10.5V OUT | 22-3 | CR, 22-3
REG +10.5V OUT | 24-4 | VA, 2-4
REG +10.5V OUT | 26-8 | BF, 2-8
REG +10.5V OUT | 22-2 | CR, 22-2
REC +10.5V OUT | 11-3 | H1001
REC +10.5V OUT | 13-3 | RP, 32-1
REC +10.5V OUT | 26-1 | BF, 2-1
REC +10.5V OUT | 27-7 | IF, 27-1
REC +10.5V OUT | 18-1 | YC, 1-3
GND | 13-2 | RP, 34-1
Y REC RF OUT (X) | 27-1 | IF, 27-1
Y REC RF OUT (G) | 27-2 | IF, 27-2
PB +10.5V | 19-6 | NC
PB +10.5V OUT | 27-3 | IF, 27-3
PB +10.5V IN | 15-4 | PSB, 6-4
PB +10.5V OUT | 13-4 | RP, 34-2
PB +10.5V OUT | 22-12 | CR, 22-12
PB +10.5V OUT | 24-3 | VA, 2-3
GND | 13-1 | RP, 32-4
GND | 11-2 | H1001
GND | 15-5 | PSB, 6-5
GND | 15-6 | PSB, 6-6
REG -10.5V IN | 15-3 | PSB, 6-3
REG -10.5V OUT | 24-5 | VA, 2-5
REG -10.5V OUT | 26-9 | BF, 2-10
L; SP SW IN | 20-1 | S1008
H; SP OUT | 16-1 | AU-49, 9-3
SW'ING PULSE OUT | 22-14 | CR, 22-14
SW'ING PULSE OUT | 25-1 | BF, 1-1
PB SYNC Y OUT | 22-15 | CR, 22-15
DEMOD Y OUT | 23-5 | VA, 1-5
L; VIDEO CH-B REC OUT | 25-7 | BF, 1-7
L; VIDEO CH-B REC IN | 12-1 | SY-22, 56-9
L; VIDEO CH-A REC IN | 12-2 | SY-22, 56-8
L; VIDEO CH-A REC OUT | 13-5 | RP, 33-3
L; VIDEO CH-B REC OUT | 13-6 | RP, 33-4
EXT SC IN (X) | 10-4 | SN-1014
EXT SC IN (G) | 10-3 | SN-1014
REC CHROMA IN (X) | 3-4 | YC, 1-7
REC CHROMA IN (G) | 3-3 | YC, 1-8
REC CHROMA OUT | 22-10 | CR, 22-10
EXT SC OUT | 22-1 | CR, 22-1
GND | 20-2 | S1008
S1008 SP
Y OUT | 2/2
V-BLK PULSE OUT | 22-16 | CR, 22-16
V-BLK PULSE IN | 2/2
GUARD BAND PULSE OUT | 22-4 | CR, 22-4
PB CHROMA OUT | 22-11 | CR, 22-11
CN22/VO-12 — CN22/CR-26
CN23/VO-12 — CN1/VA-29
CN24/VO-12 — CN2/VA-29
CN25/VO-12 — CN1/BF-12
CN26/VO-12 — CN2/RF-12
CN27/VO-12 — CN27/IF-99

VO-12 (1/2)
1-615-975-11
BVU-150P

VO-12 (2/2) (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

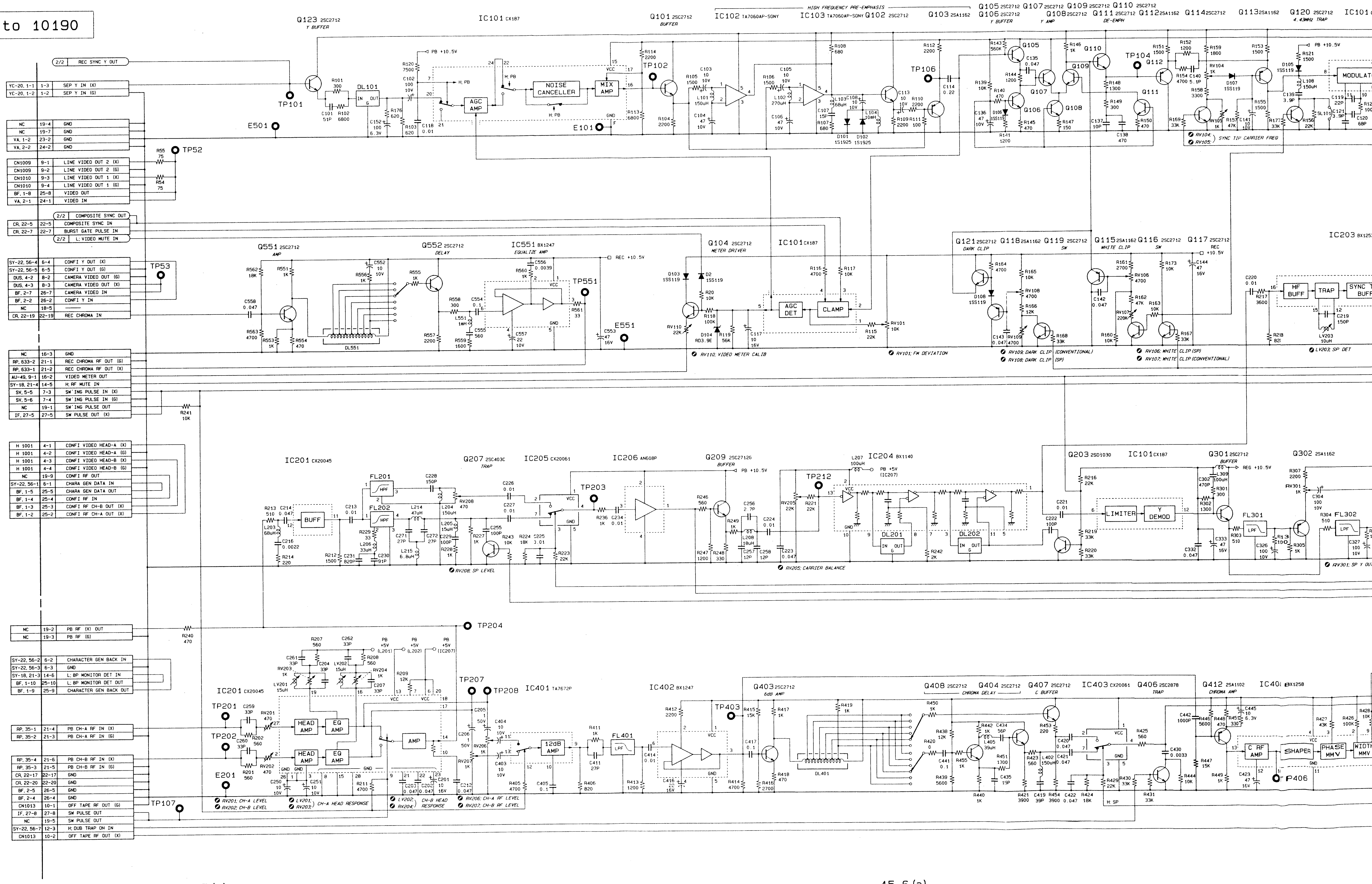
S/N; UP TO 10020

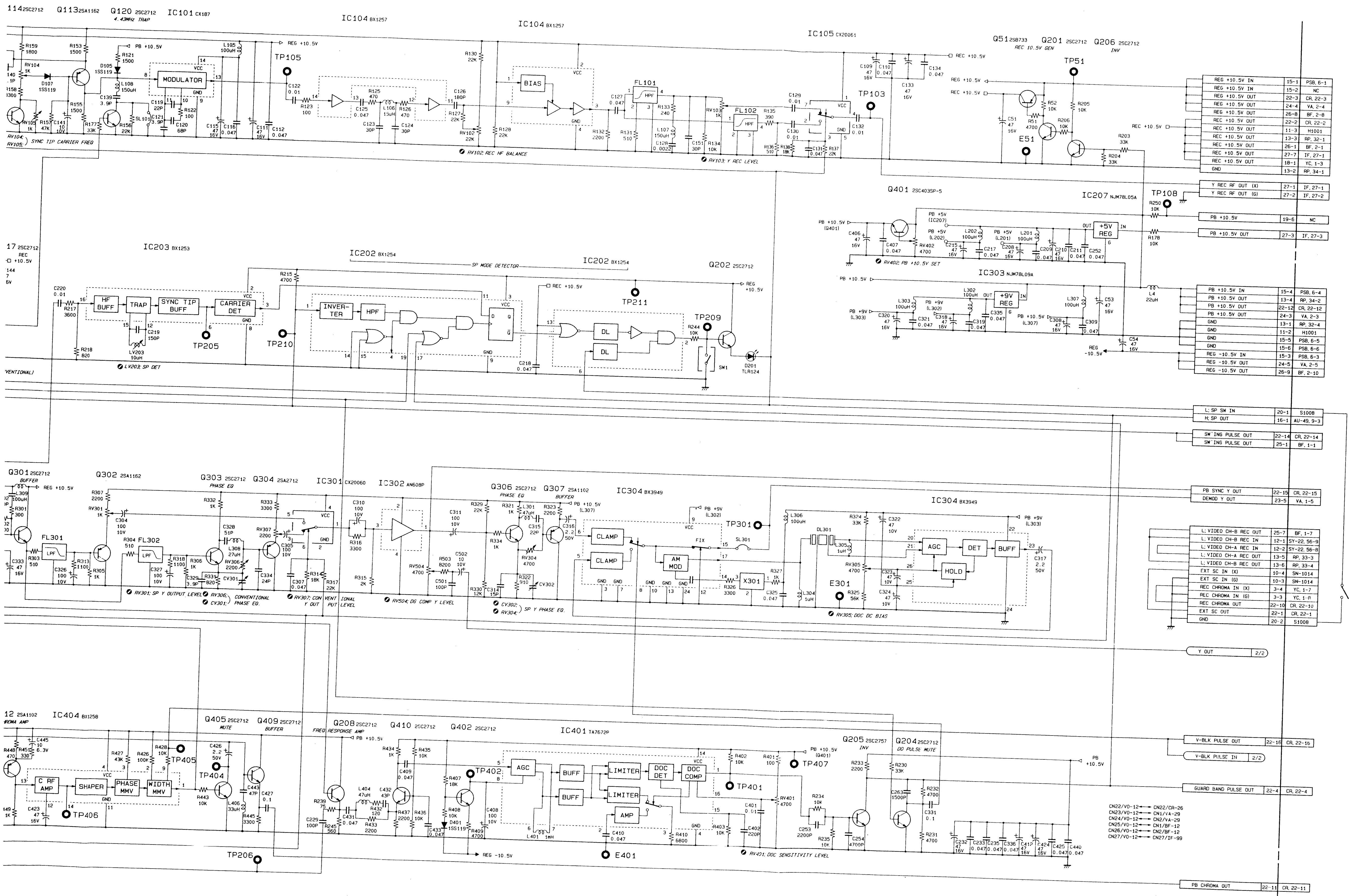




)-12 (1/2) (Y MOD/DEMODULATOR)

S/N; 10021 to 10190

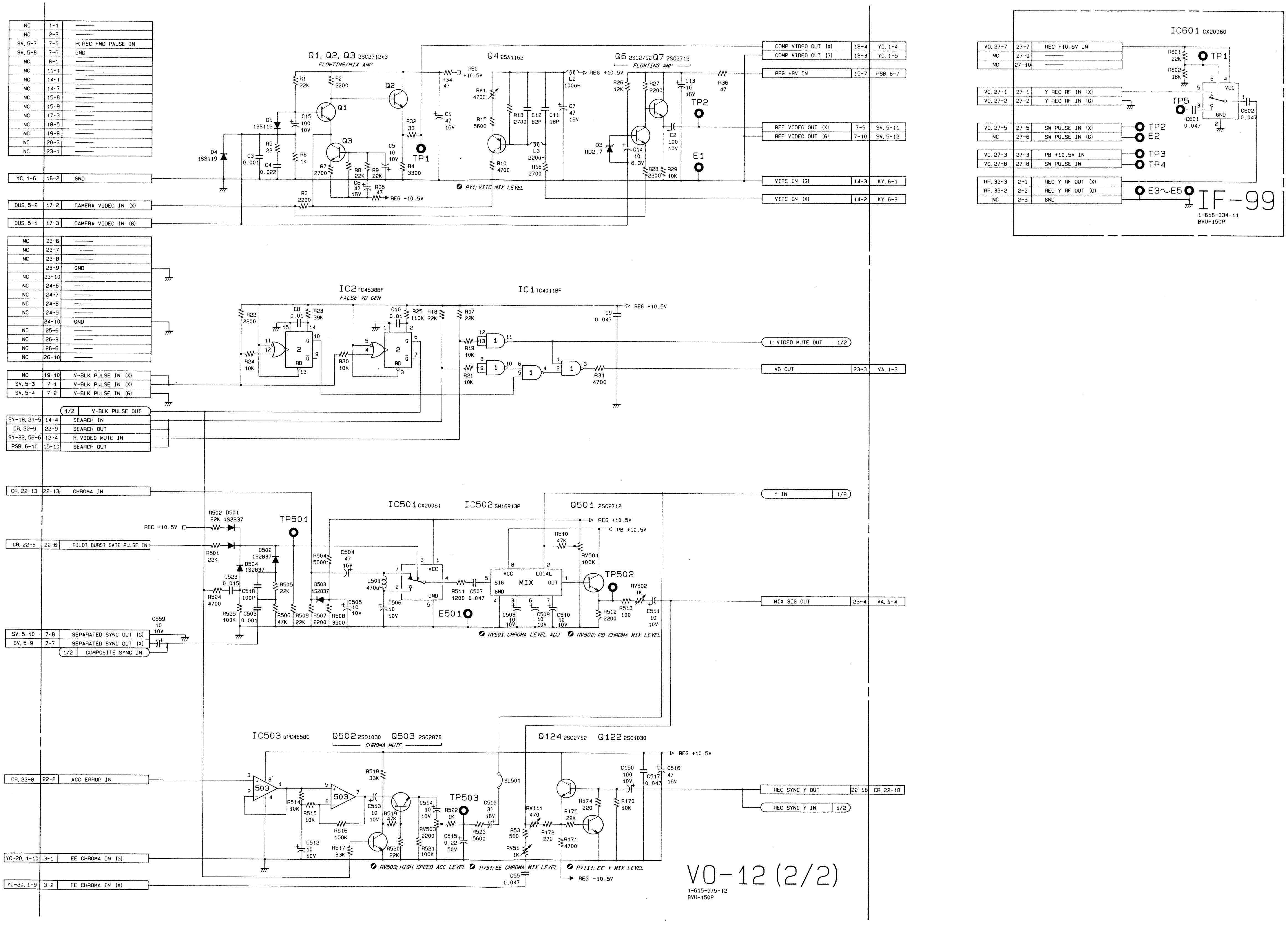



Q113 2SA1162
Q120 2SC2712 4.43MHz TRAP
IC101 CX187
MODULATOR
IC104 BX1257
BIAS
IC105 CX20061
FL101 HPF
FL102 HPF
TP105
TP103
Q51 2SB733 REC 10.5V GEN
Q201 2SC2712
Q206 2SC2712 INV
TP51
E51
RV104; RV105; SYNC TIP CARRIER FREQ
RV102; REC HF BALANCE
RV103; Y REC LEVEL
Q401 2SC4035P-5
IC207 NJM78L05A
TP108
+5V REG
RV402; PB +10.5V SET
IC303 NJM78L09A
+9V REG
IC203 BX1253
HF BUFF
TRAP
SYNC TIP BUFF
CARRIER DET
TP205
TP210
LV203; SP DET
IC202 BX1254 SP MODE DETECTOR
INVERTER
HPF
DL
TP211
TP209
Q202 2SC2712
D201 TLR124
SW1
Q301 2SC2712 BUFFER
Q302 2SA1162
Q303 2SC2712 PHASE EQ
Q304 2SA2712
IC301 CX20060
IC302 AN608P
Q306 2SC2712 PHASE EQ
Q307 2SA1102 BUFFER
IC304 BX3949
FL301 LPF
FL302 LPF
CLAMP
AM MOD
X301
FIX
SL301
TP301
AGC
DET
BUFF
HOLD
E301
RV301; SP Y OUTPUT LEVEL
RV306; CV301; CONVENTIONAL PHASE EQ.
RV307; CONVENTIONAL Y OUTPUT LEVEL
RV504; DG COMP Y LEVEL
CV302; RV304; SP Y PHASE EQ.
RV305; DOC DC BIAS
IC404 BX1258
C RF AMP
SHAPER
PHASE MMV
WIDTH MMV
TP406
TP405
TP404
Q405 2SC2712 MUTE
Q409 2SC2712 BUFFER
Q208 2SC2712 FREQ RESPONSE AMP
Q410 2SC2712
Q402 2SC2712
IC401 TA7672P
LIMITER
DOC DET
DOC COMP
AMP
TP402
TP401
TP407
E401
TP206
Q205 2SC2757 INV
Q204 2SC2712 DO PULSE MUTE
RV401; DOC SENSITIVITY LEVEL
REG +10.5V IN 15-1 PSB, 6-1
REG +10.5V IN 15-2 NC
REG +10.5V OUT 22-3 CR, 22-3
REG +10.5V OUT 24-4 VA, 2-4
REG +10.5V OUT 26-8 BF, 2-8
REC +10.5V OUT 22-2 CR, 22-2
REC +10.5V OUT 11-3 H1001
REC +10.5V OUT 13-3 RP, 32-1
REC +10.5V OUT 26-1 BF, 2-1
REC +10.5V OUT 27-7 IF, 27-1
REC +10.5V OUT 18-1 YC, 1-3
GND 13-2 RP, 34-1
Y REC RF OUT (X) 27-1 IF, 27-1
Y REC RF OUT (G) 27-2 IF, 27-2
PB +10.5V 19-6 NC
PB +10.5V OUT 27-3 IF, 27-3
PB +10.5V IN 15-4 PSB, 6-4
PB +10.5V OUT 13-4 RP, 34-2
PB +10.5V OUT 22-12 CR, 22-12
PB +10.5V OUT 24-3 VA, 2-3
GND 13-1 RP, 32-4
GND 11-2 H1001
GND 15-5 PSB, 6-5
GND 15-6 PSB, 6-6
REG -10.5V IN 15-3 PSB, 6-3
REG -10.5V OUT 24-5 VA, 2-5
REG -10.5V OUT 26-9 BF, 2-10
L; SP SW IN 20-1 S1008
H; SP OUT 16-1 AU-49, 9-3
SW'ING PULSE OUT 22-14 CR, 22-14
SW'ING PULSE OUT 25-1 BF, 1-1
PB SYNC Y OUT 22-15 CR, 22-15
DEMOD Y OUT 23-5 VA, 1-5
L; VIDEO CH-B REC OUT 25-7 BF, 1-7
L; VIDEO CH-B REC IN 12-1 SY-22, 56-9
L; VIDEO CH-A REC IN 12-2 SY-22, 56-8
L; VIDEO CH-A REC OUT 13-5 RP, 33-3
L; VIDEO CH-B REC IN 13-6 RP, 33-4
EXT SC IN (X) 10-4 SN-1014
EXT SC IN (G) 10-3 SN-1014
REC CHROMA IN (X) 3-4 YC, 1-7
REC CHROMA IN (G) 3-3 YC, 1-8
REC CHROMA OUT 22-10 CR, 22-10
EXT SC OUT 22-1 CR, 22-1
GND 20-2 S1008
S1008 SP
Y OUT 2/2
V-BLK PULSE OUT 22-16 CR, 22-16
V-BLK PULSE IN 2/2
GUARD BAND PULSE OUT 22-4 CR, 22-4
PB CHROMA OUT 22-11 CR, 22-11
CN22/VO-12 — CN22/CR-26
CN23/VO-12 — CN1/VA-29
CN24/VO-12 — CN2/VA-29
CN25/VO-12 — CN1/BF-12
CN26/VO-12 — CN2/BF-12
CN27/VO-12 — CN27/IF-99

VO-12 (1/2)
1-615-975-12
BVU-150P

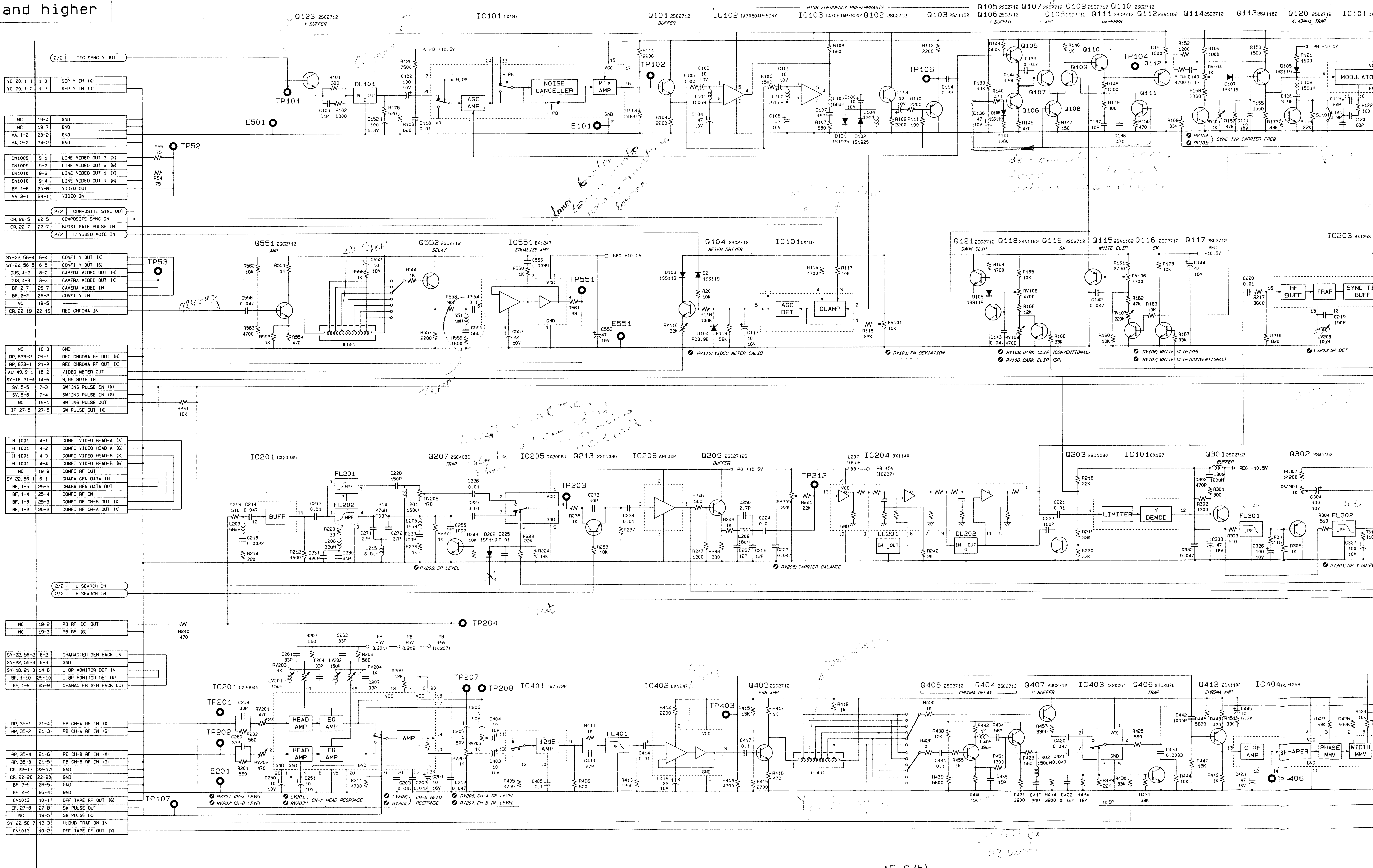
VO-12 (2/2) (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

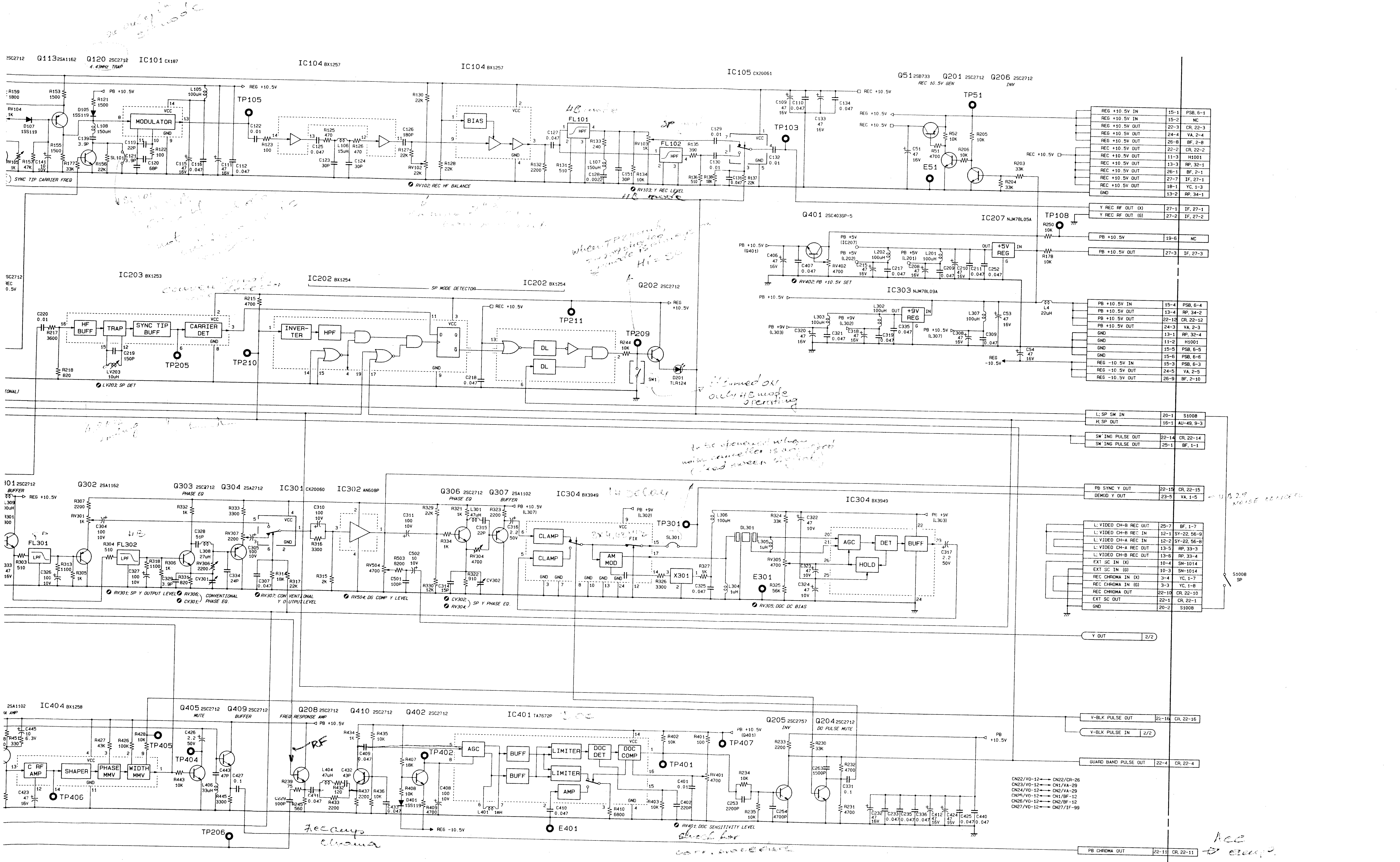
S/N; 10021 to 10190



)-12 (1/2) (Y MOD/DEMODULATOR)

S/N; 10191 and higher

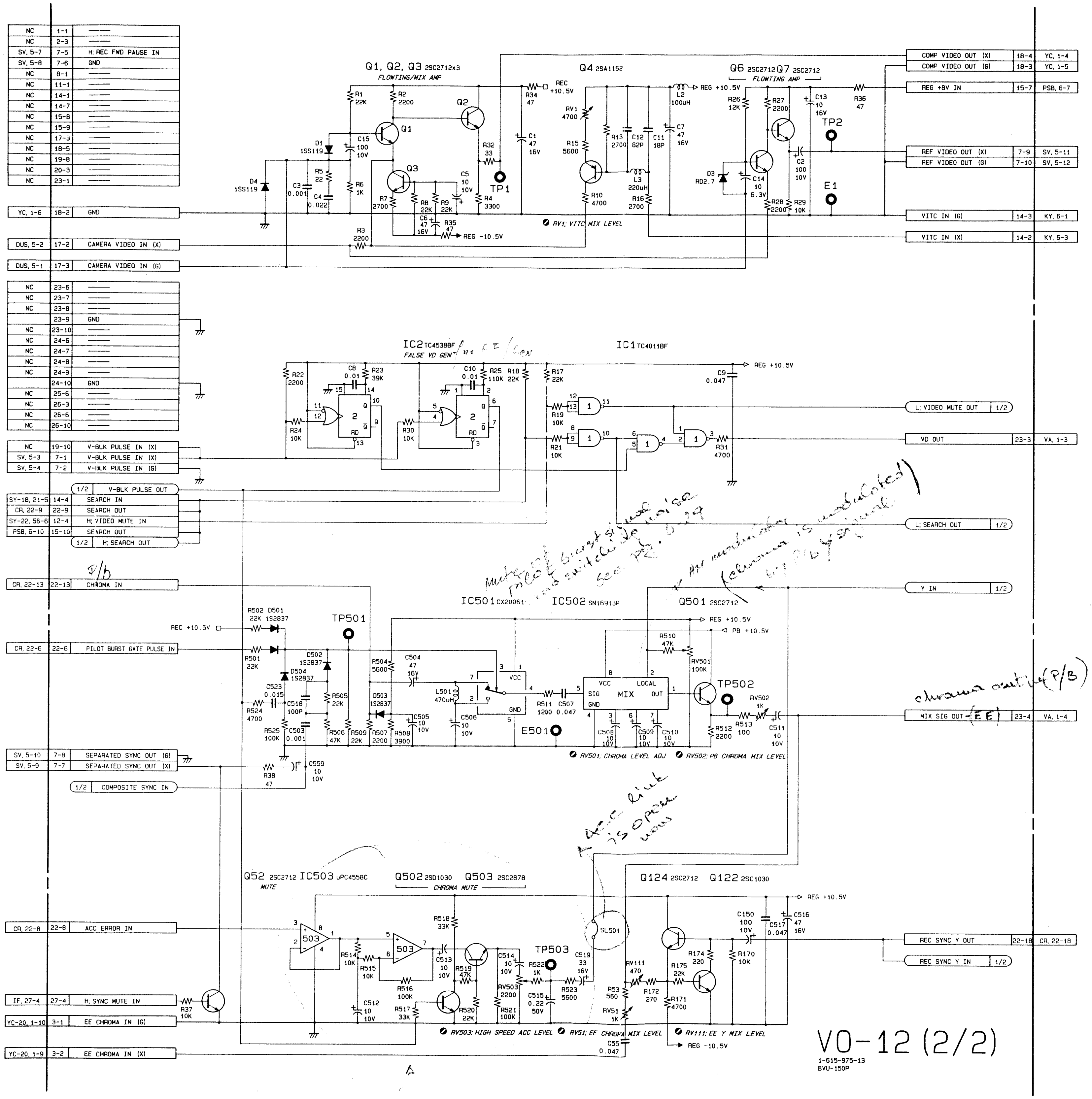




VO-12 (1/2)
1-615-975-13
BVU-150P

VO-12 (2/2) (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

S/N; 10191 and higher



P/b

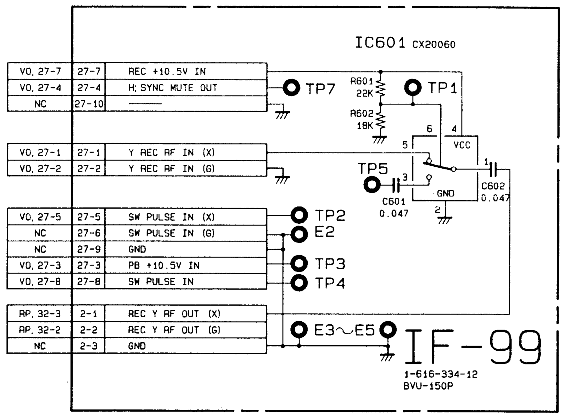
mutes out pilot burst signal and switching noise
See pg. 5.29

Y FM modulator (chroma is modulated w/ 1/6 Y signal)

chroma out (P/B)

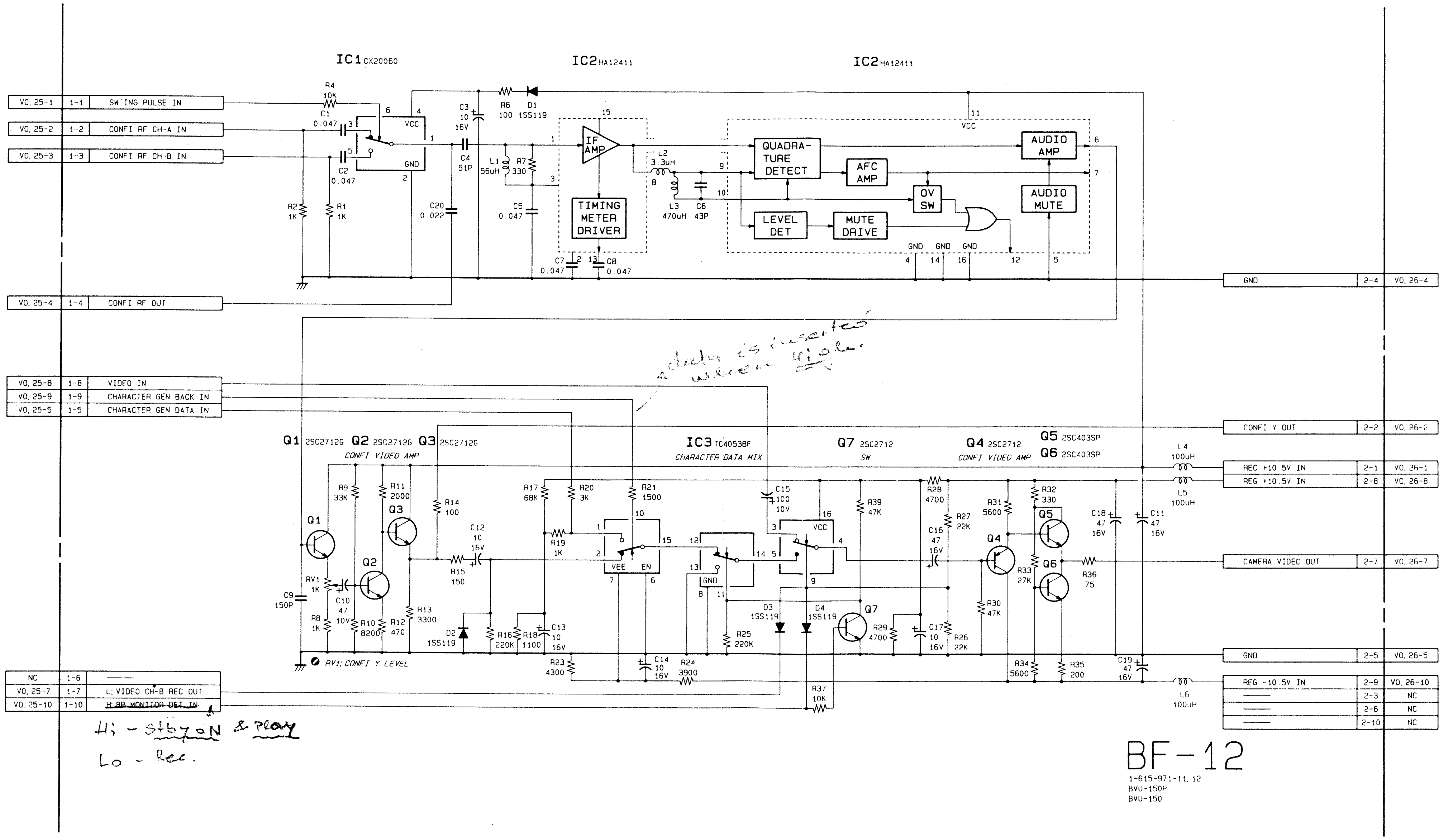
(EE)

ACC link is open now



high speed ACC circuit

BF-12 (VIEW FINDER)

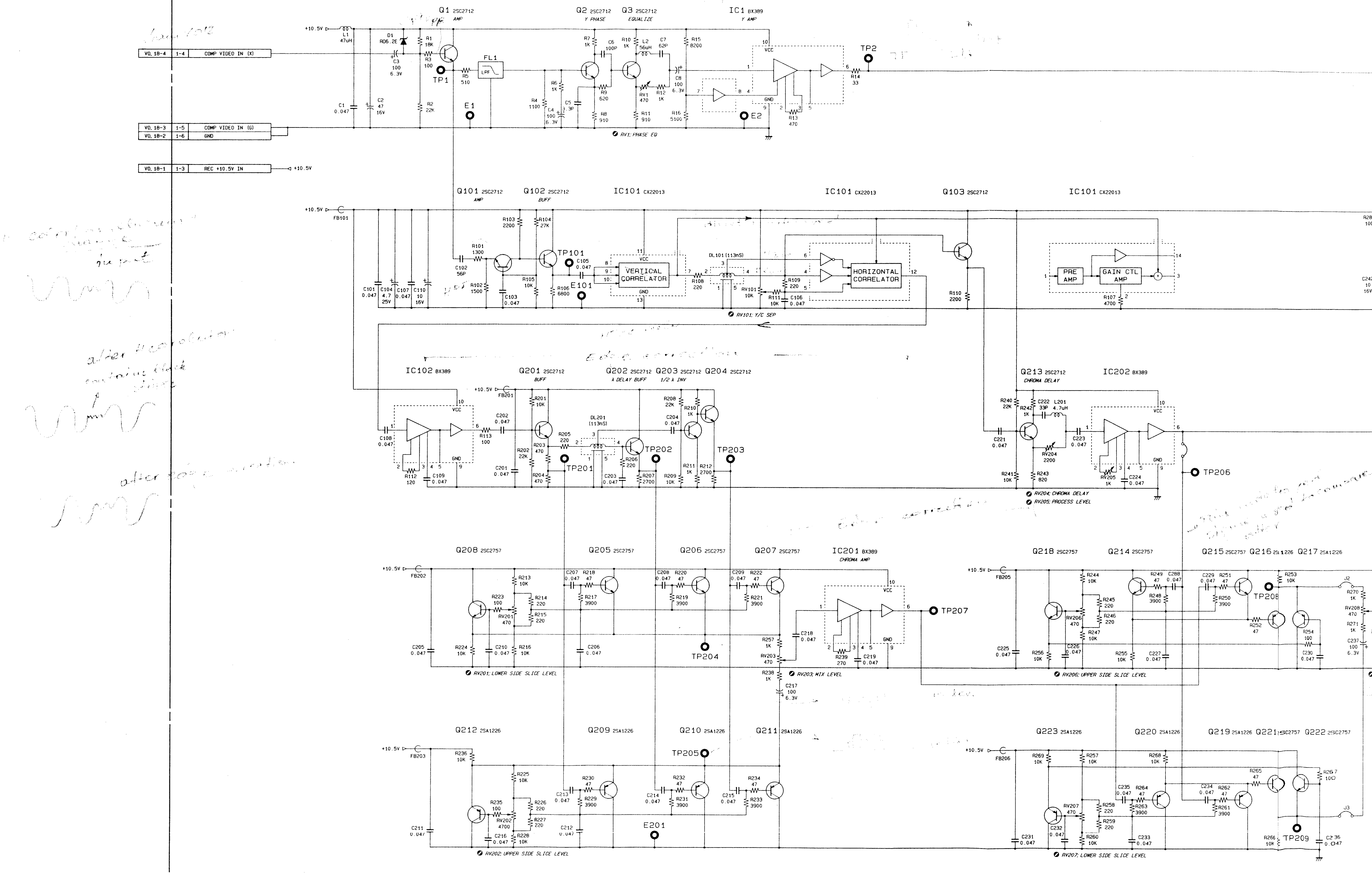


data is inserted when high

Hi - Stby ON & Play
Lo - Rec.

BF-12
1-615-971-11, 12
BVU-150P
BVU-150

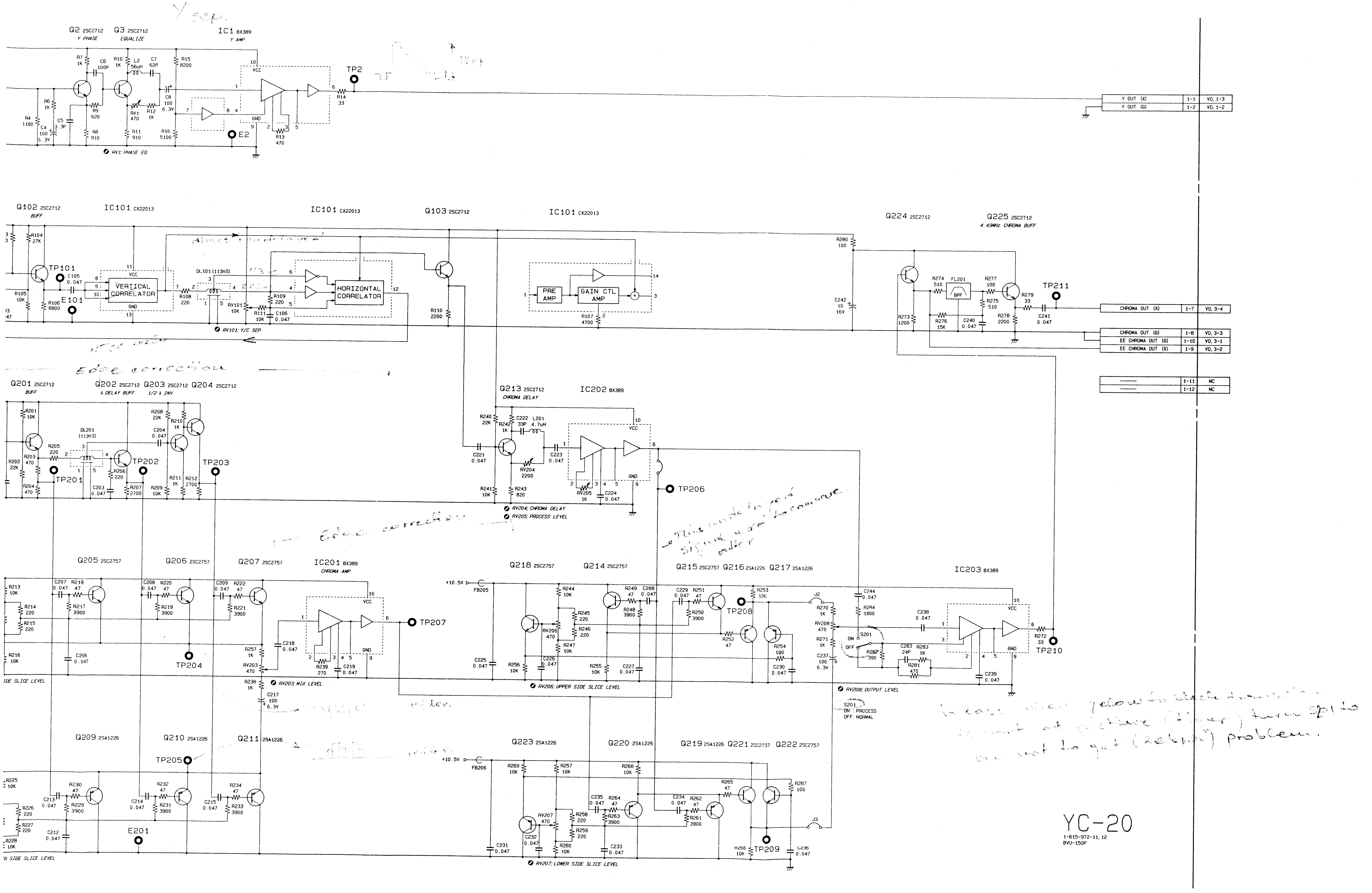
YC-20 (Y/C SEPARATOR)



after H correlator containing black

after edge correction

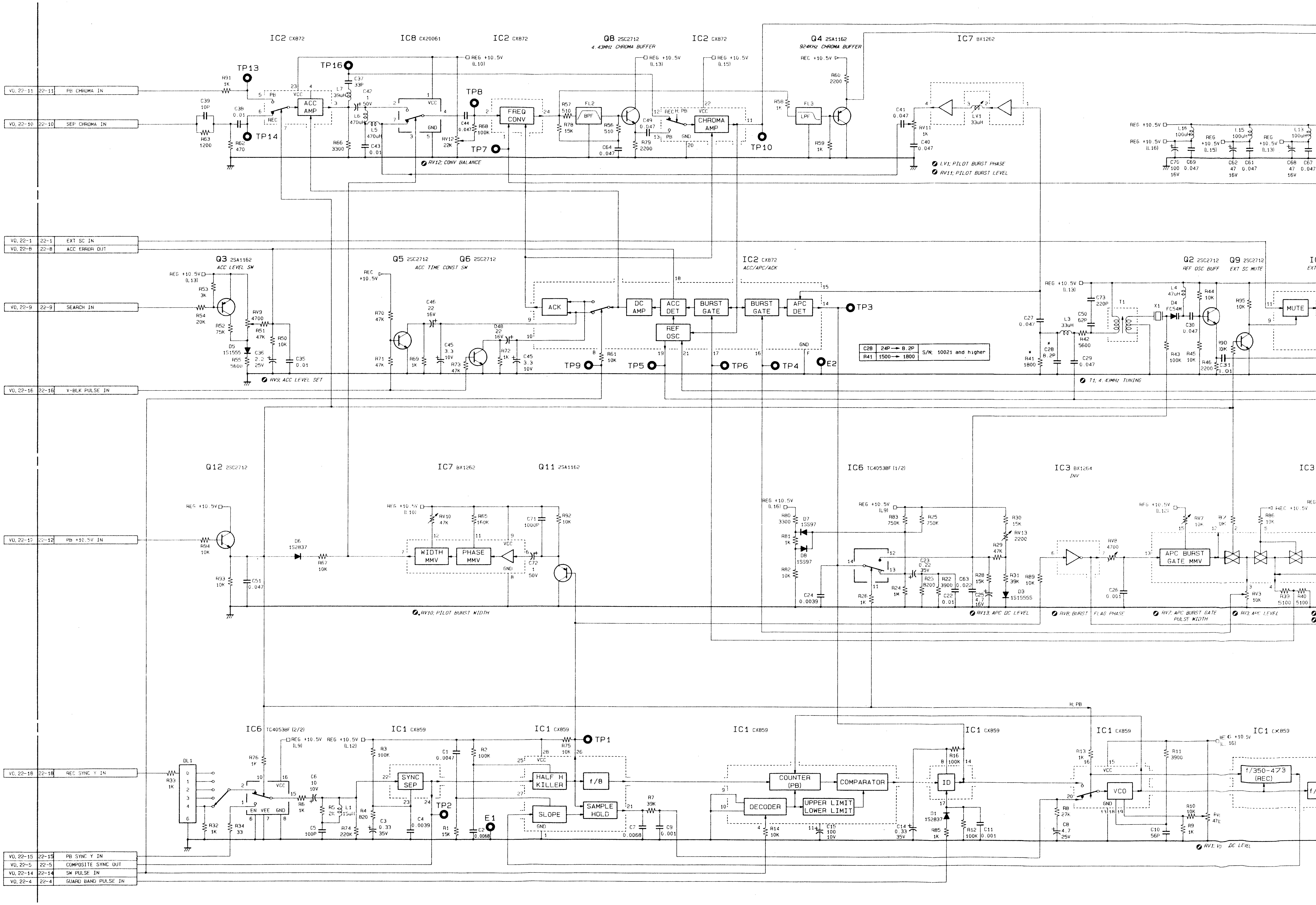
edge correction

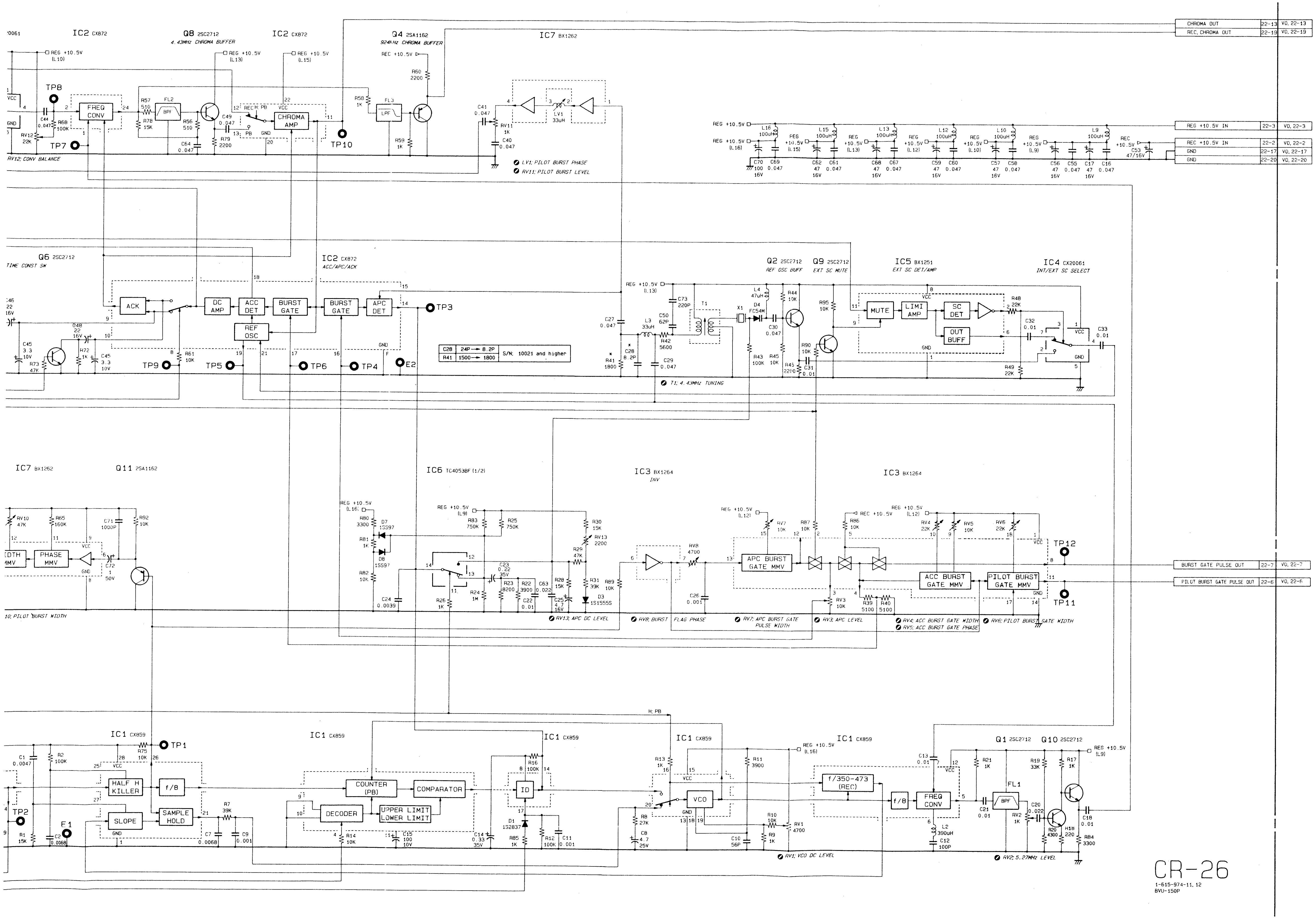


YC-20
1-615-972-11, 12
BVU-150P

R-26 (CHROMA MOD/DEMODULATOR)

S/N; UP TO 10190





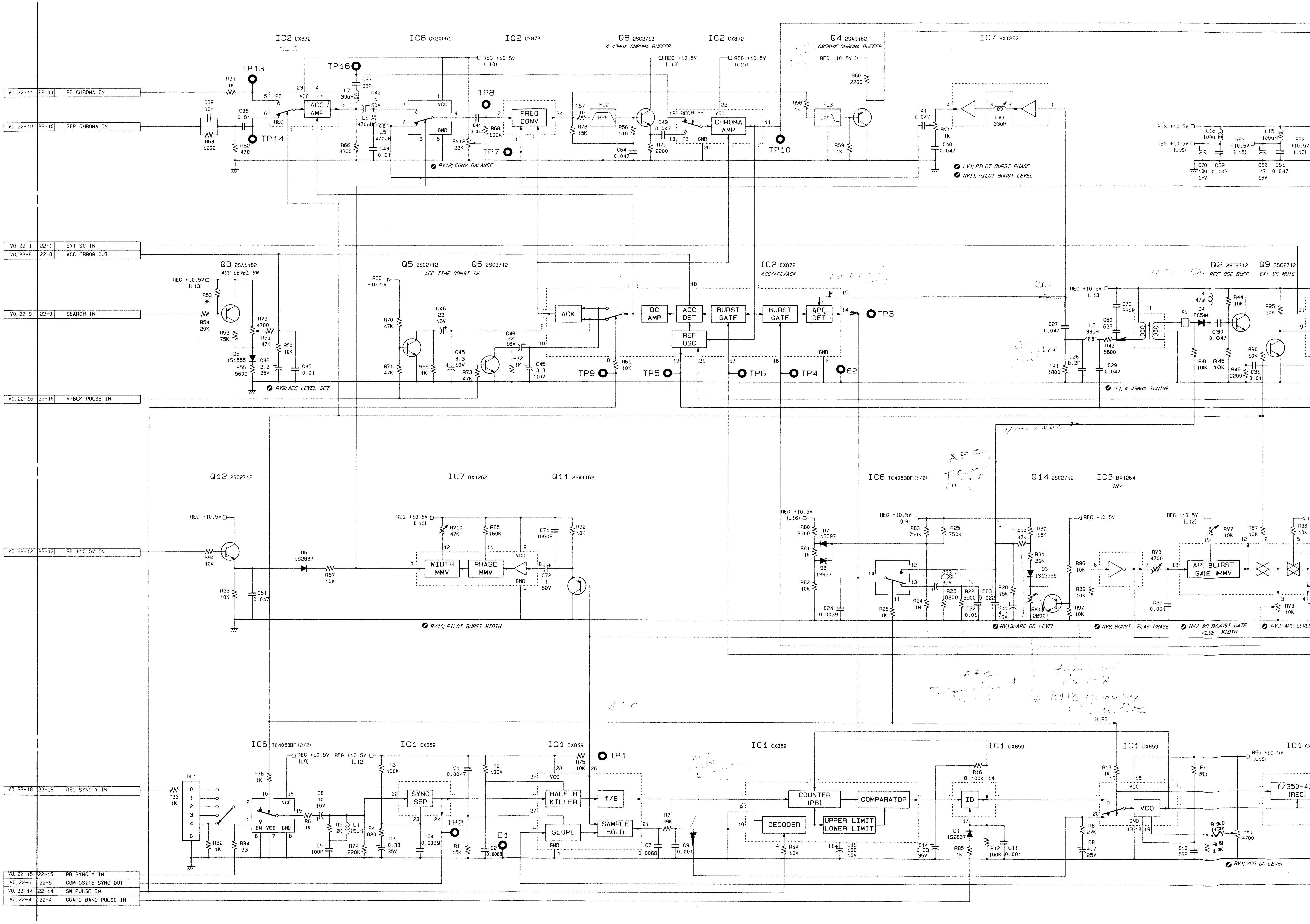
C28	24P → 8.2P	S/N. 10021 and higher
R41	1500 → 1800	

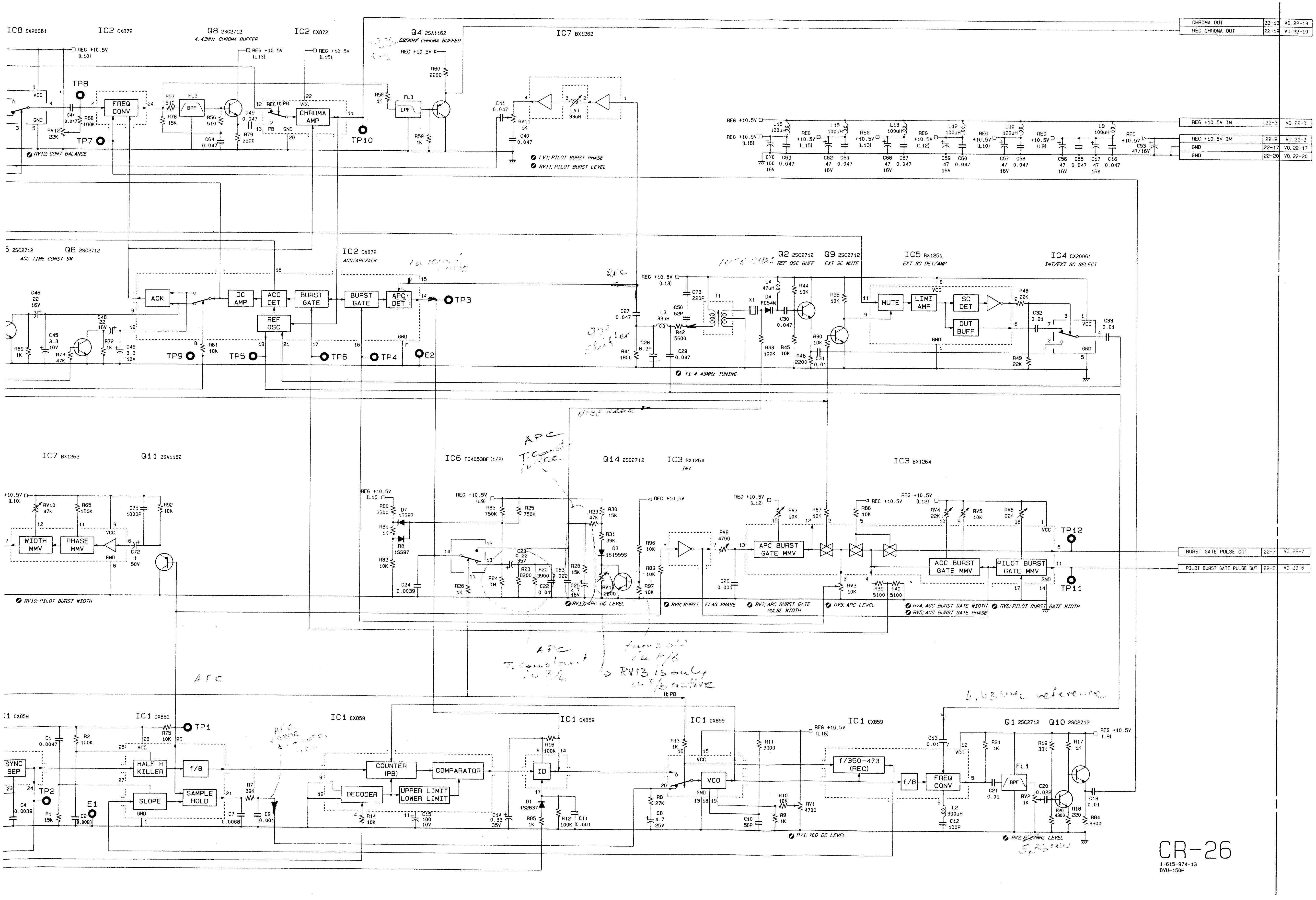
CR-26

1-615-974-11, 12
BVU-150P

CR-26 (CHROMA MOD/DEMODULATOR)

S/N; 10191 and higher





CR-26
1-615-974-13
BVU-150P

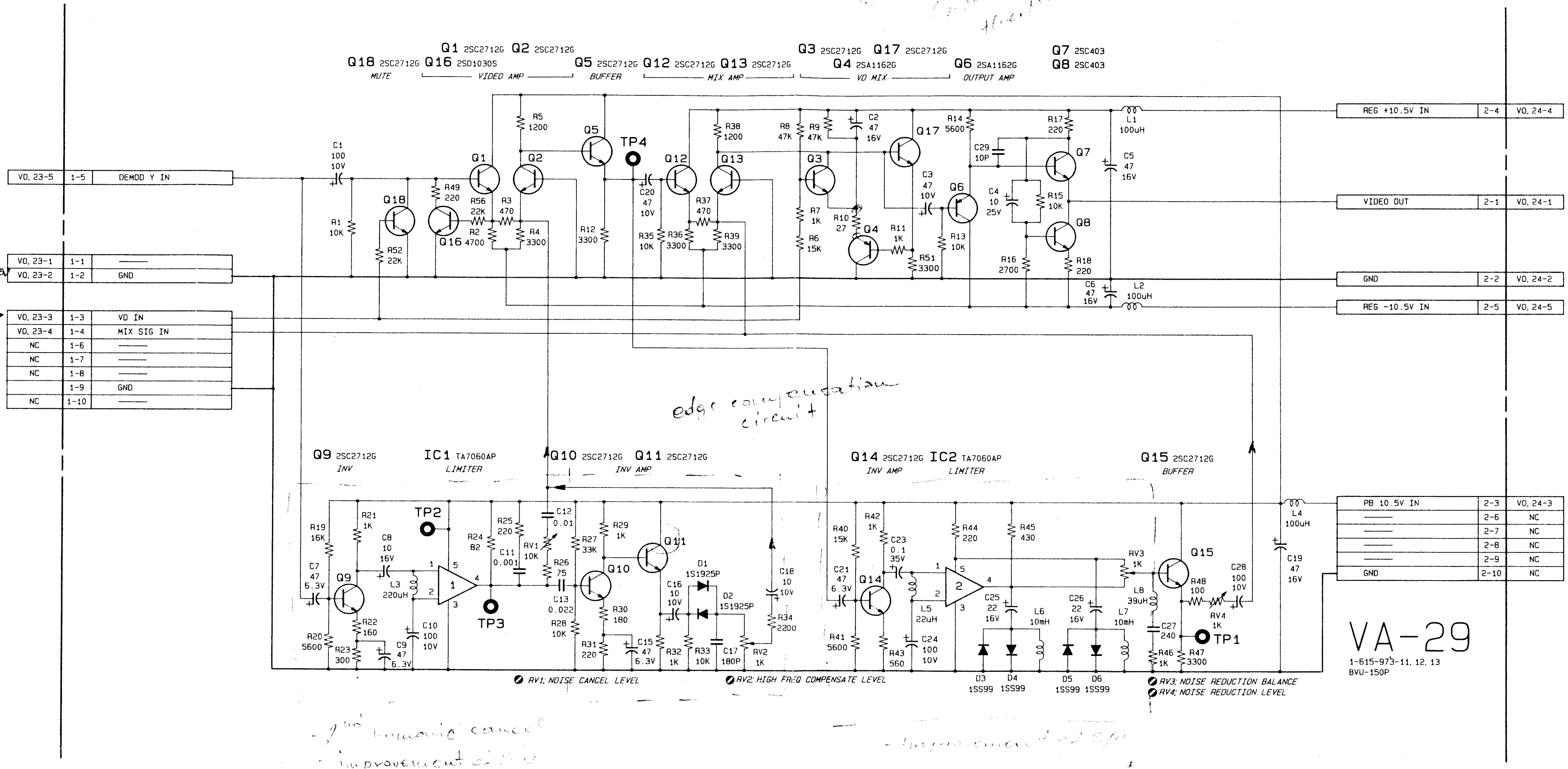
Noise canceller 3

VA-29 (Y/C MIX, VIDEO OUTPUT)

mod. clamp
Reference clamp → [illegible] off
[illegible] for mute [illegible] stage,
[illegible] [illegible] of spurs)
therefore [illegible] clamp

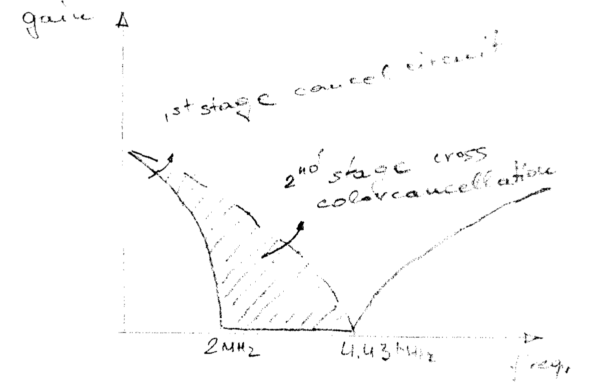
False VD in FF/REV
+
video mute

chroma
signal in P/B
Y + C in (E-E)

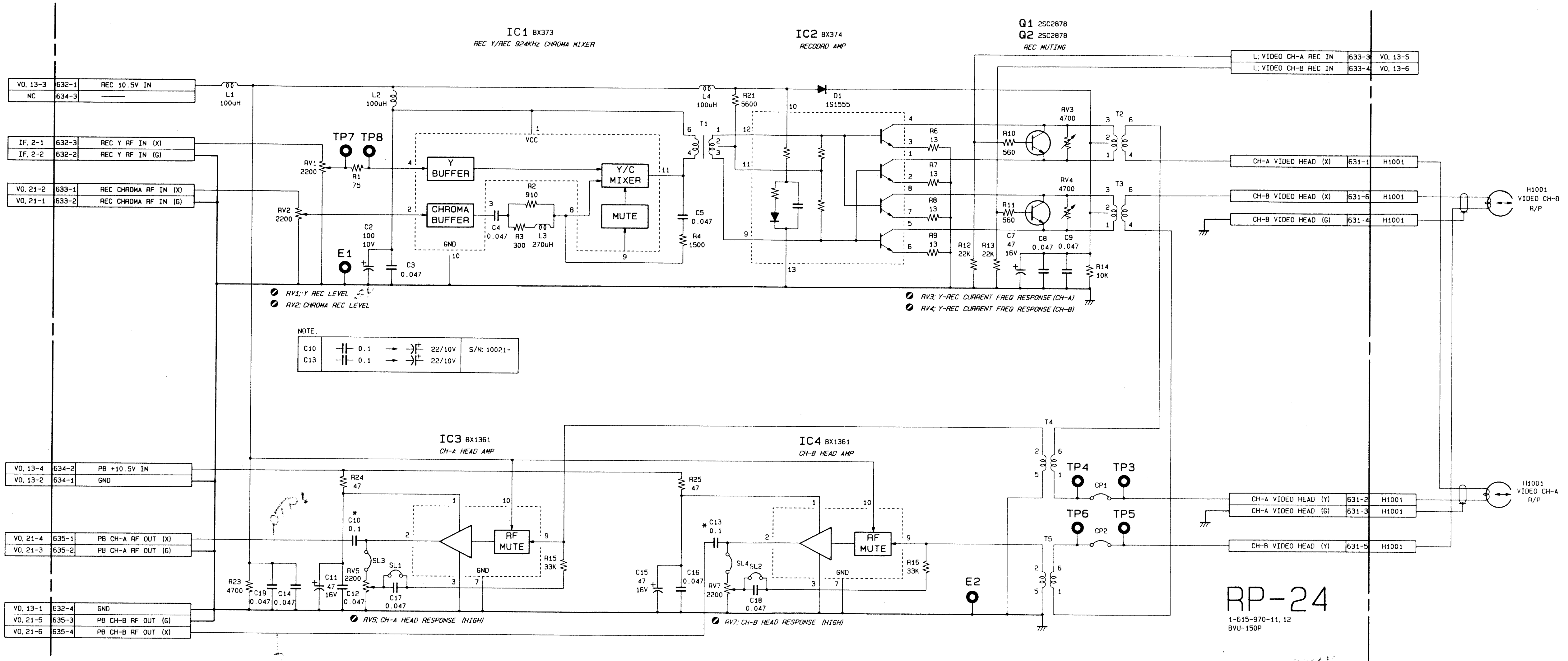


- 2nd harmonic cancel
- improvement of [illegible]
- De-emphasis for Hi freq. pre-emphasis.

- improvement of [illegible]
- cross color component cancellation.

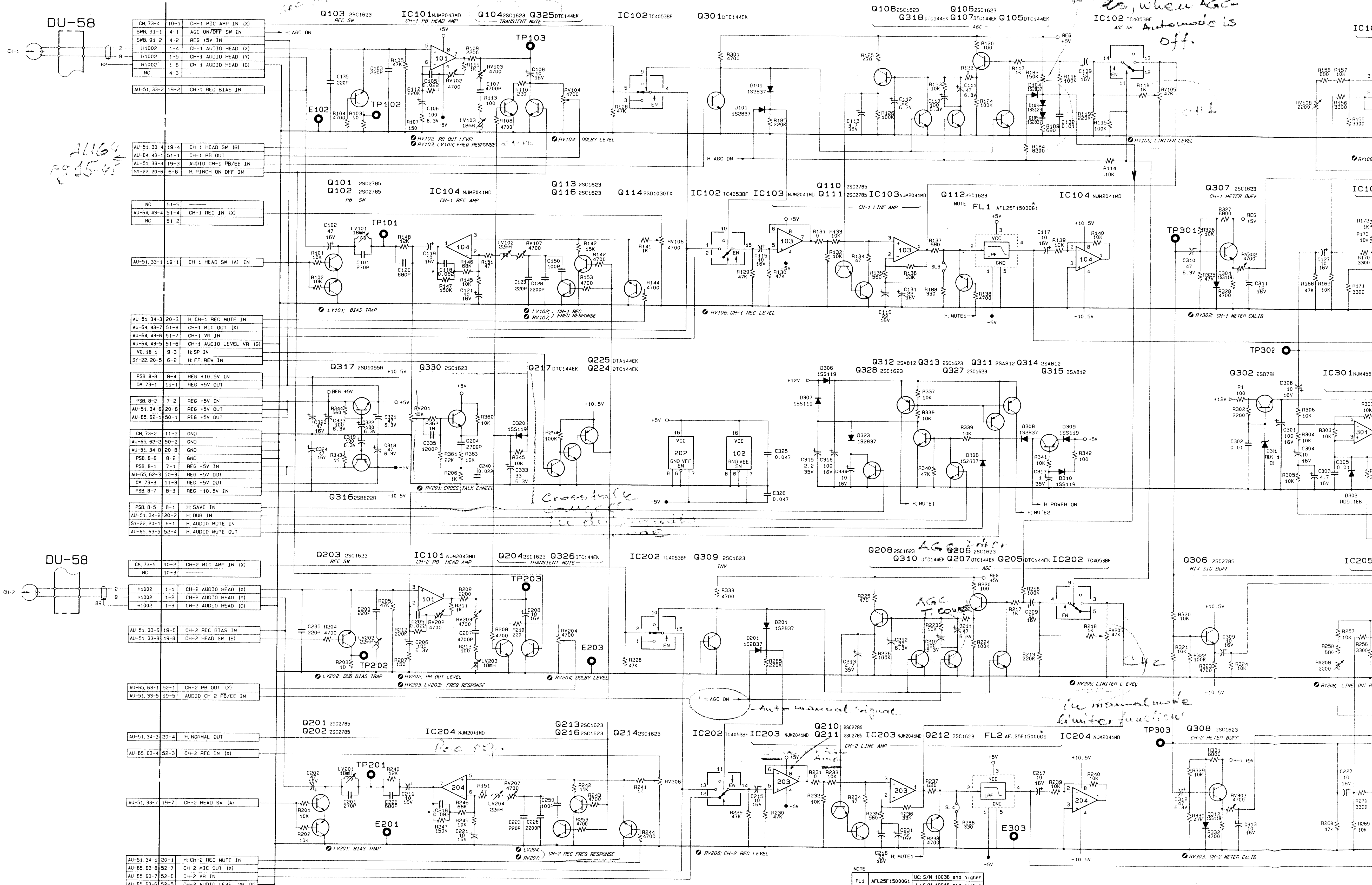


RP-24 (VIDEO REC/PB AMPLIFIER)


IC1 BX373
REC Y/REC 924KHz CHROMA MIXER
IC2 BX374
RECODRD AMP
Q1 2SC2878
Q2 2SC2878
REC MUTING
VO, 13-3 | 632-1 | REC 10.5V IN
NC | 634-3 | ———
IF, 2-1 | 632-3 | REC Y RF IN (X)
IF, 2-2 | 632-2 | REC Y RF IN (G)
VO, 21-2 | 633-1 | REC CHROMA RF IN (X)
VO, 21-1 | 633-2 | REC CHROMA RF IN (G)
L1 100uH
L2 100uH
TP7 TP8
RV1 2200
R1 75
RV2 2200
C2 100 10V
E1
C3 0.047
VCC
Y BUFFER
CHROMA BUFFER
GND
R2 910
C4 0.047
R3 300
L3 270uH
Y/C MIXER
MUTE
C5 0.047
R4 1500
L4 100uH
R21 5600
T1
D1 1S1555
R6 13
R7 13
R8 13
R9 13
R10 560
R11 560
RV3 4700
RV4 4700
T2
T3
R12 22K
R13 22K
C7 47 16V
C8 0.047
C9 0.047
R14 10K
L; VIDEO CH-A REC IN | 633-3 | VO, 13-5
L; VIDEO CH-B REC IN | 633-4 | VO, 13-6
CH-A VIDEO HEAD (X) | 631-1 | H1001
CH-B VIDEO HEAD (X) | 631-6 | H1001
CH-B VIDEO HEAD (G) | 631-4 | H1001
H1001 VIDEO CH-B R/P
RV1; Y REC LEVEL
RV2; CHROMA REC LEVEL
RV3; Y-REC CURRENT FREQ RESPONSE (CH-A)
RV4; Y-REC CURRENT FREQ RESPONSE (CH-B)
NOTE.
C10 | 0.1 → 22/10V | S/N: 10021-
C13 | 0.1 → 22/10V
IC3 BX1361
CH-A HEAD AMP
IC4 BX1361
CH-B HEAD AMP
VO, 13-4 | 634-2 | PB +10.5V IN
VO, 13-2 | 634-1 | GND
VO, 21-4 | 635-1 | PB CH-A RF OUT (X)
VO, 21-3 | 635-2 | PB CH-A RF OUT (G)
VO, 13-1 | 632-4 | GND
VO, 21-5 | 635-3 | PB CH-B RF OUT (G)
VO, 21-6 | 635-4 | PB CH-B RF OUT (X)
R24 47
R25 47
*C10 0.1
*C13 0.1
RF MUTE
R15 33K
R16 33K
R23 4700
C19 0.047
C14 0.047
C11 47 16V
C12 0.047
RV5 2200
SL3
SL1
C17 0.047
C15 47 16V
C16 0.047
RV7 2200
SL4
SL2
C18 0.047
E2
RV5; CH-A HEAD RESPONSE (HIGH)
RV7; CH-B HEAD RESPONSE (HIGH)
T4
T5
TP4 TP3
CP1
TP6 TP5
CP2
CH-A VIDEO HEAD (Y) | 631-2 | H1001
CH-A VIDEO HEAD (G) | 631-3 | H1001
CH-B VIDEO HEAD (Y) | 631-5 | H1001
H1001 VIDEO CH-A R/P
RP-24
1-615-970-11, 12
BVU-150P

Sweep gen.

AU-49A (AUDIO REC/PB AMPLIFIER)
DU-58 (AUDIO R/P/ERASE, CTL HEAD)
DUS-6 (TRACKING VR)
DUS-69


DU-58
CH-1
CH-2
Q103 2SC1623 REC SW
IC101 NJM2043MD CH-1 PB HEAD AMP
Q104 2SC1623 Q325 DTC144EK TRANSIENT MUTE
IC102 TC4053BF
Q301 DTC144EK
Q108 2SC1623 Q106 2SC1623
Q318 DTC144EK Q107 DTC144EK Q105 DTC144EK AGC
IC102 TC4053BF AGC SW
TP103
TP102
E102
TP101
Q101 2SC2785 Q102 2SC2785 PB SW
IC104 NJM2041MD CH-1 REC AMP
Q113 2SC1623 Q116 2SC1623
Q114 2SD1030TX
IC102 TC4053BF IC103 NJM2041MD
Q110 2SC2785 Q111 2SC2785 IC103 NJM2041MD CH-1 LINE AMP
Q112 2SC1623 MUTE
FL1 AFL25F15000G1
IC104 NJM2041MD
Q307 2SC1623 CH-1 METER BUFF
TP301
TP302
Q302 2SD781
IC301 NJM456
RV102: PB OUT LEVEL
RV103, LV103: FREQ RESPONSE
RV104: DOLBY LEVEL
RV105: LIMITER LEVEL
LV101: BIAS TRAP
LV102: CH-1 REC
RV107: FREQ RESPONSE
RV106: CH-1 REC LEVEL
RV302: CH-1 METER CALIB
H, AGC ON
H, MUTE1
H, MUTE2
H, POWER ON
Q317 2SD1055A
Q316 2SB822A
Q330 2SC1623
Q217 DTC144EK
Q225 DTA144EK Q224 DTC144EK
RV201: CROSS TALK CANCEL
Q312 2SA812 Q313 2SC1623 Q311 2SA812 Q314 2SA812
Q328 2SC1623 Q327 2SC1623 Q315 2SA812
Q203 2SC1623 REC SW
IC101 NJM2043MD CH-2 PB HEAD AMP
Q204 2SC1623 Q326 DTC144EK TRANSIENT MUTE
TP203
IC202 TC4053BF
Q309 2SC1623 INV
Q208 2SC1623 Q206 2SC1623
Q310 DTC144EK Q207 DTC144EK Q205 DTC144EK AGC
IC202 TC4053BF
Q306 2SC2785 MIX SIG BUFF
IC205
TP202
E203
LV202: DUB BIAS TRAP
RV202: PB OUT LEVEL
RV203, LV203: FREQ RESPONSE
RV204: DOLBY LEVEL
RV205: LIMITER LEVEL
RV208: LINE OUT
Q201 2SC2785 Q202 2SC2785
IC204 NJM2041MD
Q213 2SC1623 Q216 2SC1623
Q214 2SC1623
IC202 TC4053BF IC203 NJM2041MD
Q210 2SC2785 Q211 2SC2785 IC203 NJM2041MD CH-2 LINE AMP
Q212 2SC1623
FL2 AFL25F15000G1
IC204 NJM2041MD
TP303
Q308 2SC1623 CH-2 METER BUFF
TP201
E201
E303
LV201: BIAS TRAP
LV204: RV207: CH-2 REC FREQ RESPONSE
RV206: CH-2 REC LEVEL
RV303: CH-2 METER CALIB

CN, 73-4	10-1	CH-1 MIC AMP IN (X)
SWB, 91-1	4-1	AGC ON/OFF SW IN
SWB, 91-2	4-2	REG +5V IN
H1002	1-4	CH-1 AUDIO HEAD (X)
H1002	1-5	CH-1 AUDIO HEAD (Y)
H1002	1-6	CH-1 AUDIO HEAD (G)
NC	4-3	———

AU-51, 33-2	19-2	CH-1 REC BIAS IN

AU-51, 33-4	19-4	CH-1 HEAD SW (B)
AU-64, 43-1	51-1	CH-1 PB OUT
AU-51, 33-3	19-3	AUDIO CH-1 PB/EE IN
SY-22, 20-6	6-6	H; PINCH ON OFF IN

NC	51-5	———
AU-64, 43-4	51-4	CH-1 REC IN (X)
NC	51-2	———

AU-51, 33-1	19-1	CH-1 HEAD SW (A) IN

AU-51, 34-3	20-3	H; CH-1 REC MUTE IN
AU-64, 43-7	51-8	CH-1 MIC OUT (X)
AU-64, 43-6	51-7	CH-1 VR IN
AU-64, 43-5	51-6	CH-1 AUDIO LEVEL VR (G)
VO, 16-1	9-3	H; SP IN
SY-22, 20-5	6-2	H; FF, REW IN

PSB, 8-8	8-4	REG +10.5V IN
CN, 73-1	11-1	REG +5V OUT

PSB, 8-2	7-2	REG +5V IN
AU-51, 34-6	20-6	REG +5V OUT
AU-65, 62-1	50-1	REG +5V OUT

CN, 73-2	11-2	GND
AU-65, 62-2	50-2	GND
AU-51, 34-8	20-8	GND
PSB, 8-6	8-2	GND
PSB, 8-1	7-1	REG -5V IN
AU-65, 62-3	50-3	REG -5V OUT
CN, 73-3	11-3	REG -5V OUT
PSB, 8-7	8-3	REG -10.5V IN

PSB, 8-5	8-1	H; SAVE IN
AU-51, 34-2	20-2	H; DUB IN
SY-22, 20-1	6-1	H; AUDIO MUTE IN
AU-65, 63-5	52-4	H; AUDIO MUTE OUT

CN, 73-5	10-2	CH-2 MIC AMP IN (X)
NC	10-3	———

H1002	1-1	CH-2 AUDIO HEAD (X)
H1002	1-2	CH-2 AUDIO HEAD (Y)
H1002	1-3	CH-2 AUDIO HEAD (G)

AU-51, 33-6	19-6	CH-2 REC BIAS IN
AU-51, 33-8	19-8	CH-2 HEAD SW (B)

AU-65, 63-1	52-1	CH-2 PB OUT (X)
AU-51, 33-5	19-5	AUDIO CH-2 PB/EE IN

AU-51, 34-3	20-4	H; NORMAL OUT

AU-65, 63-4	52-3	CH-2 REC IN (X)

AU-51, 33-7	19-7	CH-2 HEAD SW (A)

AU-51, 34-1	20-1	H; CH-2 REC MUTE IN
AU-65, 63-8	52-7	CH-2 MIC OUT (X)
AU-65, 63-7	52-6	CH-2 VR IN
AU-65, 63-6	52-5	CH-2 AUDIO LEVEL VR (G)

— Limiter — in manual mode for both channels, when AGC-Automode is off.

21169 P8 15-41

Crosstalk

AGC 2 ms.

AGC T. const

Auto manual signal

in manual mode limiter function

Rec EQ.

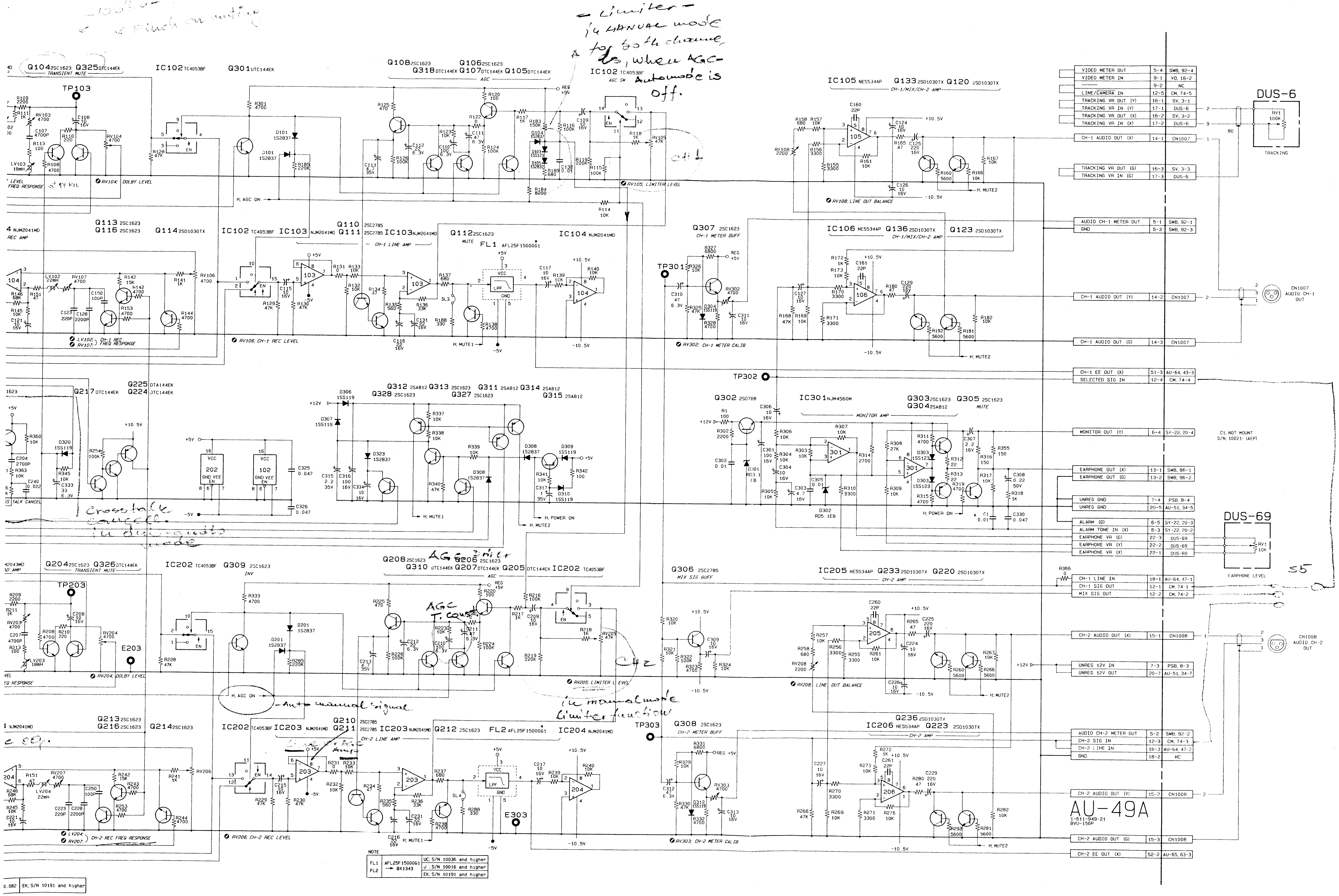
NOTE

C118 C218	0.047 → 0.082	EK; S/N 10191 and higher

NOTE

FL1 FL2	AFL25F15000G1 → BX1343	UC; S/N 10036 and higher J ; S/N 10016 and higher EK; S/N 10191 and higher

AU-49A, DU-58, DUS-6, DUS-69


Q104 2SC1623 Q325 DTC144EK TRANSIENT MUTE
IC102 TC4053BF
Q301 DTC144EK
Q108 2SC1623 Q106 2SC1623
Q318 DTC144EK Q107 DTC144EK Q105 DTC144EK AGC
IC102 TC4053BF AGC SW
IC105 NE5534AP Q133 2SD1030TX Q120 2SD1030TX CH-1/MIX/CH-2 AMP
DUS-6
TRACKING
TP103
RV104; DOLBY LEVEL
RV105; LIMITER LEVEL
RV108; LINE OUT BALANCE
Q113 2SC1623 Q116 2SC1623 Q114 2SD1030TX
IC102 TC4053BF IC103 NJM2041MD Q110 2SC2785 Q111 2SC2785 IC103 NJM2041MD CH-1 LINE AMP
Q112 2SC1623 MUTE
FL1 AFL25F15000G1
IC104 NJM2041MD
Q307 2SC1623 CH-1 METER BUFF
IC106 NE5534AP Q136 2SD1030TX Q123 2SD1030TX CH-1/MIX/CH-2 AMP
TP301
LV102; CH-1 REC FREQ RESPONSE
RV106; CH-1 REC LEVEL
RV302; CH-1 METER CALIB
CN1007 AUDIO CH-1 OUT
TP302
Q225 DTA144EK Q224 DTC144EK Q217 DTC144EK
Q312 2SA812 Q313 2SC1623 Q311 2SA812 Q314 2SA812
Q328 2SC1623 Q327 2SC1623 Q315 2SA812
Q302 2SD788
IC301 NJM4560M MONITOR AMP
Q303 2SC1623 Q305 2SC1623 Q304 2SA812 MUTE
H; POWER ON
H; MUTE1
H; MUTE2
C1; NOT MOUNT S/N; 10021- (AEP)
DUS-69
EARPHONE LEVEL
Q204 2SC1623 Q326 DTC144EK TRANSIENT MUTE
IC202 TC4053BF Q309 2SC1623 INV
Q208 2SC1623 Q206 2SC1623
Q310 DTC144EK Q207 DTC144EK Q205 DTC144EK IC202 TC4053BF AGC
Q306 2SC2785 MIX SIG BUFF
IC205 NE5534AP Q233 2SD1030TX Q220 2SD1030TX CH-2 AMP
TP203
E203
RV204; DOLBY LEVEL
RV205; LIMITER LEVEL
RV208; LINE OUT BALANCE
CN1008 AUDIO CH-2 OUT
Q213 2SC1623 Q216 2SC1623 Q214 2SC1623
IC202 TC4053BF IC203 NJM2041MD Q210 2SC2785 Q211 2SC2785 IC203 NJM2041MD CH-2 LINE AMP
Q212 2SC1623 FL2 AFL25F15000G1 IC204 NJM2041MD
TP303
Q308 2SC1623 CH-2 METER BUFF
Q236 2SD1030TX IC206 NE5534AP Q223 2SD1030TX CH-2 AMP
E303
LV204; CH-2 REC FREQ RESPONSE
RV207
RV206; CH-2 REC LEVEL
RV303; CH-2 METER CALIB
H; AGC ON
VIDEO METER OUT 5-4 SWB, 92-4
VIDEO METER IN 9-1 VD, 16-2
LINE/CAMERA IN 12-5 CM, 74-5
TRACKING VR OUT (Y) 16-1 SV, 3-1
TRACKING VR IN (Y) 17-1 DUS-6
TRACKING VR OUT (X) 16-2 SV, 3-2
TRACKING VR IN (X) 17-2 DUS-6
CH-1 AUDIO OUT (X) 14-1 CN1007
TRACKING VR OUT (G) 16-3 SV, 3-3
TRACKING VR IN (G) 17-3 DUS-6
AUDIO CH-1 METER OUT 5-1 SWB, 92-1
GND 5-3 SWB, 92-3
CH-1 AUDIO OUT (Y) 14-2 CN1007
CH-1 AUDIO OUT (G) 14-3 CN1007
CH-1 EE OUT (X) 51-3 AU-64, 43-3
SELECTED SIG IN 12-4 CM, 74-4
MONITOR OUT (Y) 6-4 SY-22, 20-4
EARPHONE OUT (X) 13-1 SWB, 96-1
EARPHONE OUT (G) 13-2 SWB, 96-2
UNREG GND 7-4 PSB, 8-4
UNREG GND 20-5 AU-51, 34-5
ALARM (G) 6-5 SY-22, 20-3
ALARM TONE IN (X) 6-3 SY-22, 20-2
EARPHONE VR (G) 22-3 DUS-69
EARPHONE VR (Y) 22-2 DUS-69
EARPHONE VR (X) 22-1 DUS-69
CH-1 LINE IN 18-1 AU-64, 47-1
CH-1 SIG OUT 12-1 CM, 74-1
MIX SIG OUT 12-2 CM, 74-2
CH-2 AUDIO OUT (X) 15-1 CN1008
UNREG 12V IN 7-3 PSB, 8-3
UNREG 12V OUT 20-7 AU-51, 34-7
AUDIO CH-2 METER OUT 5-2 SWB, 92-2
CH-2 SIG IN 12-3 CM, 74-3
CH-2 LINE IN 18-3 AU-64, 47-2
GND 18-2 NC
CH-2 AUDIO OUT (Y) 15-2 CN1008
CH-2 AUDIO OUT (G) 15-3 CN1008
CH-2 EE OUT (X) 52-2 AU-65, 63-3
- Limiter - 1/4 MANUAL mode for both channels, when AGC-Automode is off.
Crosstalk cancel in dual-audio mode
AGC-Limiter
AGC T. const
Auto manual signal
in manual mode Limiter function
55

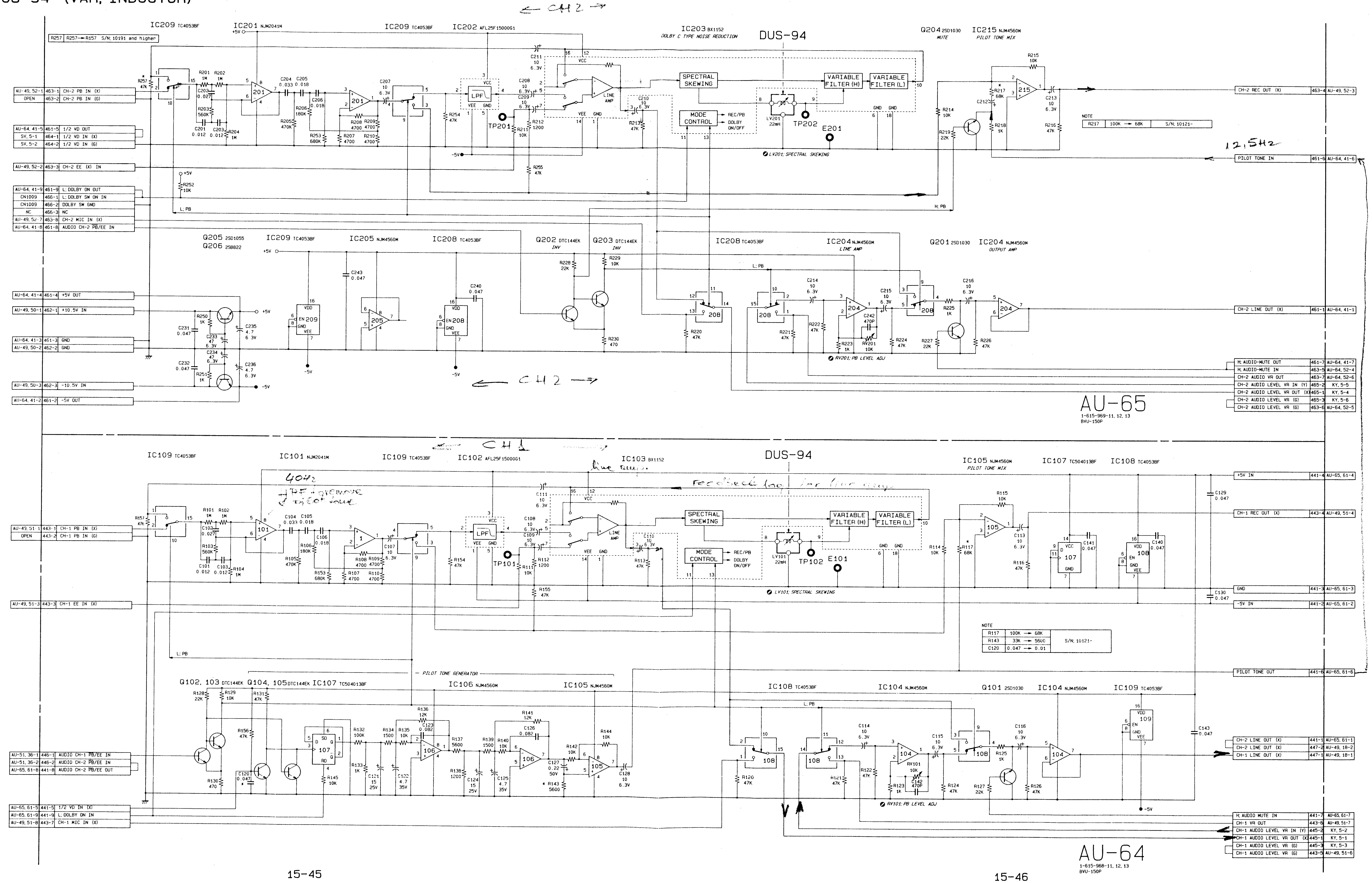
NOTE

FL1	AFL25F15000G1	UC; S/N 10036 and higher
FL2	→ BX1343	J ; S/N 10016 and higher
		EK; S/N 10191 and higher

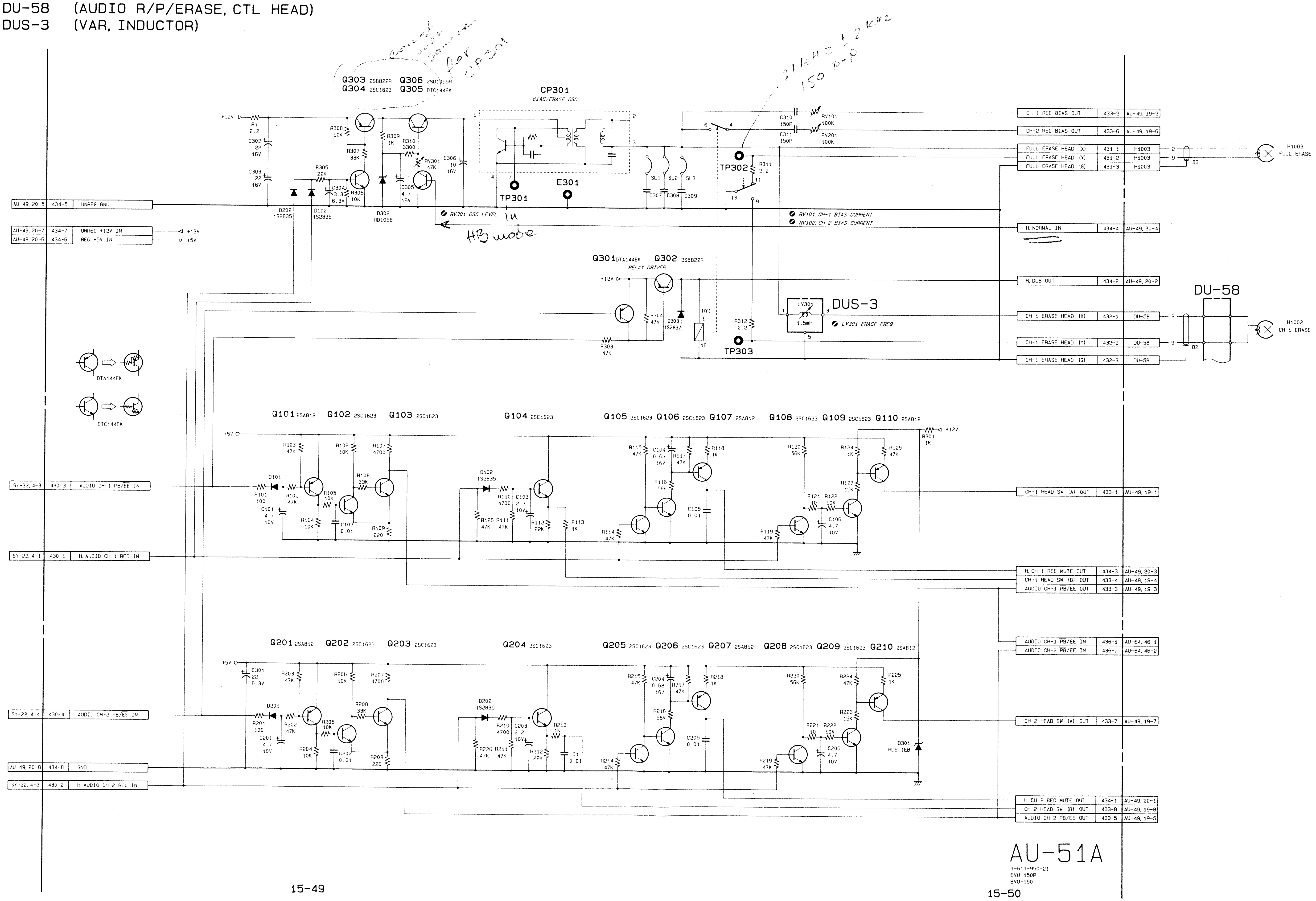
0.082 EK; S/N 10191 and higher

AU-49A
1-511-949-21
BVU-150P

AU-64 (AUDIO CH-1 DOLBY)
AU-65 (AUDIO CH-2 DOLBY)
DUS-94 (VAR. INDUCTOR)

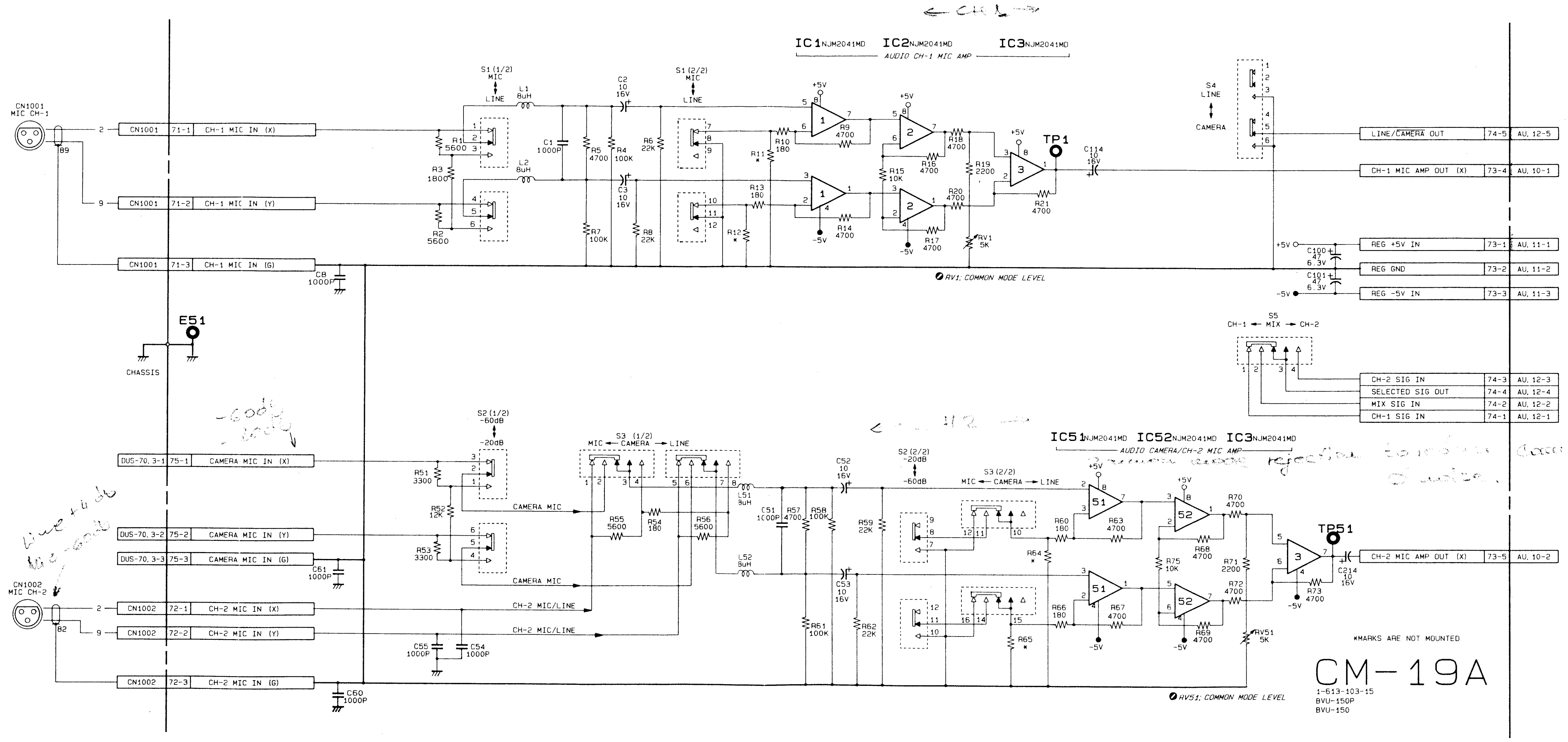

← CH 2 →
R257 | R257 → R157 S/N; 10191 and higher
IC209 TC4053BF
IC201 NJM2041M
IC202 AFL25F1500G1
IC203 BX1152 DOLBY C TYPE NOISE REDUCTION
DUS-94
Q204 2SD1030 MUTE
IC215 NJM4560M PILOT TONE MIX
SPECTRAL SKEWING
VARIABLE FILTER (H)
VARIABLE FILTER (L)
MODE CONTROL
REC/PB
DOLBY ON/OFF
LINE AMP
LPF
TP201
TP202
E201
LV201; SPECTRAL SKEWING
NOTE R217 100K → 68K S/N; 10121-
12.5Hz
AU-49, 52-1 463-1 CH-2 PB IN (X)
OPEN 463-2 CH-2 PB IN (G)
AU-64, 41-5 461-5 1/2 VD OUT
SV, 5-1 464-1 1/2 VD IN (X)
SV, 5-2 464-2 1/2 VD IN (G)
AU-49, 52-2 463-3 CH-2 EE (X) IN
AU-64, 41-9 461-9 L; DOLBY ON OUT
CN1009 466-1 L; DOLBY SW ON IN
CN1009 466-2 DOLBY SW GND
NC 466-3 NC
AU-49, 52-7 463-8 CH-2 MIC IN (X)
AU-64, 41-8 461-8 AUDIO CH-2 PB/EE IN
CH-2 REC OUT (X) 463-4 AU-49, 52-3
PILOT TONE IN 461-6 AU-64, 41-6
Q205 2SD1055
Q206 2SB822
IC205 NJM4560M
IC208 TC4053BF
Q202 DTC144EK INV
Q203 DTC144EK INV
IC204 NJM4560M LINE AMP
Q201 2SD1030
IC204 NJM4560M OUTPUT AMP
RV201; PB LEVEL ADJ
AU-64, 41-4 461-4 +5V OUT
AU-49, 50-1 462-1 +10.5V IN
AU-64, 41-3 461-3 GND
AU-49, 50-2 462-2 GND
AU-49, 50-3 462-3 -10.5V IN
AU-64, 41-2 461-2 -5V OUT
CH-2 LINE OUT (X) 461-1 AU-64, 41-1
H; AUDIO-MUTE OUT 461-7 AU-64, 41-7
H; AUDIO-MUTE IN 463-5 AU-64, 52-4
CH-2 AUDIO VR OUT 463-7 AU-64, 52-6
CH-2 AUDIO LEVEL VR IN (Y) 465-2 KY, 5-5
CH-2 AUDIO LEVEL VR OUT (X) 465-1 KY, 5-4
CH-2 AUDIO LEVEL VR (G) 465-3 KY, 5-6
CH-2 AUDIO LEVEL VR (G) 463-6 AU-64, 52-5
AU-65
1-615-969-11, 12, 13
BVU-150P
← CH 1 →
IC109 TC4053BF
IC101 NJM2041M
IC102 AFL25F1500G1
IC103 BX1152
line amp
400Hz
HPF to remove + reject loud
feedback loop for line amp
IC105 NJM4560M PILOT TONE MIX
IC107 TC5040138F
IC108 TC4053BF
TP101
TP102
E101
LV101; SPECTRAL SKEWING
NOTE
R117 100K → 68K
R143 33K → 5600 S/N; 10121-
C120 0.047 → 0.01
AU-49, 51-1 443-1 CH-1 PB IN (X)
OPEN 443-2 CH-1 PB IN (G)
AU-49, 51-3 443-3 CH-1 EE IN (X)
+5V IN 441-4 AU-65, 61-4
CH-1 REC OUT (X) 443-4 AU-49, 51-4
GND 441-3 AU-65, 61-3
-5V IN 441-2 AU-65, 61-2
PILOT TONE OUT 441-6 AU-65, 61-6
PILOT TONE GENERATOR
Q102, 103 DTC144EK
Q104, 105 DTC144EK
IC107 TC5040138F
IC106 NJM4560M
IC105 NJM4560M
IC108 TC4053BF
IC104 NJM4560M
Q101 2SD1030
IC104 NJM4560M
IC109 TC4053BF
RV101; PB LEVEL ADJ
AU-51, 36-1 446-1 AUDIO CH-1 PB/EE IN
AU-51, 36-2 446-2 AUDIO CH-2 PB/EE IN
AU-65, 61-8 441-8 AUDIO CH-2 PB/EE OUT
AU-65, 61-5 441-5 1/2 VD IN (X)
AU-65, 61-9 441-9 L; DOLBY ON IN
AU-49, 51-8 443-7 CH-1 MIC IN (X)
CH-2 LINE OUT (X) 441-1 AU-65, 61-1
CH-2 LINE OUT (X) 447-2 AU-49, 18-2
CH-1 LINE OUT (X) 447-1 AU-49, 18-1
H; AUDIO MUTE IN 441-7 AU-65, 61-7
CH-1 VR OUT 443-6 AU-49, 51-7
CH-1 AUDIO LEVEL VR IN (Y) 445-2 KY, 5-2
CH-1 AUDIO LEVEL VR OUT (X) 445-1 KY, 5-1
CH-1 AUDIO LEVEL VR (G) 445-3 KY, 5-3
CH-1 AUDIO LEVEL VR (G) 443-5 AU-49, 51-6
AU-64
1-615-968-11, 12, 13
BVU-150P

AU-51A (BIAS/ERASE OSC, REC/PB CONTROL)
DU-58 (AUDIO R/P/ERASE, CTL HEAD)
DUS-3 (VAR, INDUCTOR)

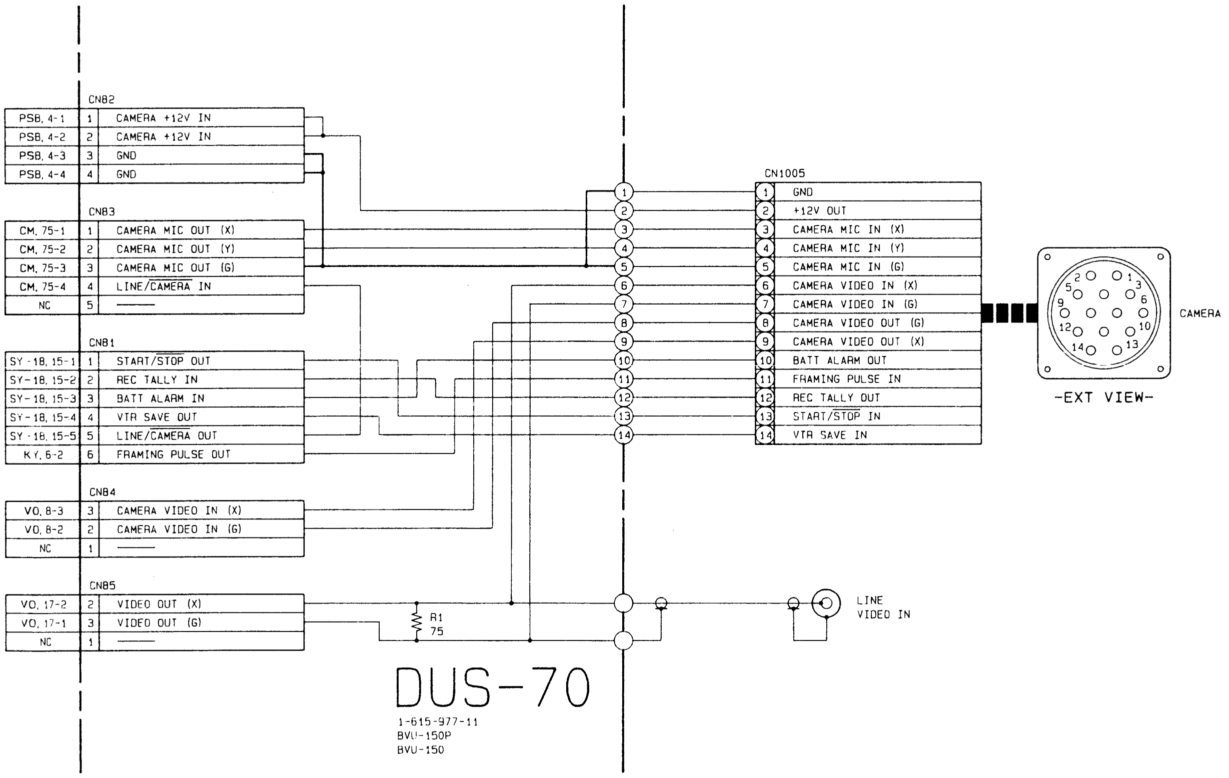

[illegible] for CP301
Q303 2SB822R Q306 2SD1055R
Q304 2SC1623 Q305 DTC144EK
CP301
BIAS/ERASE OSC
21KHz ± 2KHz
150 p-p
+12V
R1 2.2
C302 22 16V
C303 22 16V
R308 10K
R309 1K
R310 3300
R307 33K
R305 22K
C304 3.3 6.3V
R306 10K
RV301 47K
C305 4.7 16V
C306 10 16V
D202 1S2835
D102 1S2835
D302 RD10EB
TP301
E301
SL1 SL2 SL3
C307 C308 C309
C310 150P
C311 150P
RV101 100K
RV201 100K
TP302
R311 2.2
RV301; OSC LEVEL
1u
HB mode
RV101; CH-1 BIAS CURRENT
RV102; CH-2 BIAS CURRENT
AU-49, 20-5 | 434-5 | UNREG GND
AU-49, 20-7 | 434-7 | UNREG +12V IN
AU-49, 20-6 | 434-6 | REG +5V IN
+12V
+5V
CH-1 REC BIAS OUT | 433-2 | AU-49, 19-2
CH-2 REC BIAS OUT | 433-6 | AU-49, 19-6
FULL ERASE HEAD (X) | 431-1 | H1003
FULL ERASE HEAD (Y) | 431-2 | H1003
FULL ERASE HEAD (G) | 431-3 | H1003
H1003 FULL ERASE
H; NORMAL IN | 434-4 | AU-49, 20-4
H; DUB OUT | 434-2 | AU-49, 20-2
Q301 DTA144EK Q302 2SB822R
RELAY DRIVER
R304 47K
D303 1S2837
RY1
R303 47K
R312 2.2
TP303
LV301 1.5mH
DUS-3
LV301; ERASE FREQ
DU-58
CH-1 ERASE HEAD (X) | 432-1 | DU-58
CH-1 ERASE HEAD (Y) | 432-2 | DU-58
CH-1 ERASE HEAD (G) | 432-3 | DU-58
H1002 CH-1 ERASE
DTA144EK
DTC144EK
Q101 2SA812 Q102 2SC1623 Q103 2SC1623 Q104 2SC1623 Q105 2SC1623 Q106 2SC1623 Q107 2SA812 Q108 2SC1623 Q109 2SC1623 Q110 2SA812
SY-22, 4-3 | 430-3 | AUDIO CH-1 PB/EE IN
SY-22, 4-1 | 430-1 | H; AUDIO CH-1 REC IN
CH-1 HEAD SW (A) OUT | 433-1 | AU-49, 19-1
H; CH-1 REC MUTE OUT | 434-3 | AU-49, 20-3
CH-1 HEAD SW (B) OUT | 433-4 | AU-49, 19-4
AUDIO CH-1 PB/EE OUT | 433-3 | AU-49, 19-3
AUDIO CH-1 PB/EE IN | 436-1 | AU-64, 46-1
AUDIO CH-2 PB/EE IN | 436-2 | AU-64, 46-2
R301 1K
Q201 2SA812 Q202 2SC1623 Q203 2SC1623 Q204 2SC1623 Q205 2SC1623 Q206 2SC1623 Q207 2SA812 Q208 2SC1623 Q209 2SC1623 Q210 2SA812
C301 22 6.3V
SY-22, 4-4 | 430-4 | AUDIO CH-2 PB/EE IN
AU-49, 20-8 | 434-8 | GND
SY-22, 4-2 | 430-2 | H; AUDIO CH-2 REC IN
CH-2 HEAD SW (A) OUT | 433-7 | AU-49, 19-7
D301 RD9.1EB
H; CH-2 REC MUTE OUT | 434-1 | AU-49, 20-1
CH-2 HEAD SW (B) OUT | 433-8 | AU-49, 19-8
AUDIO CH-2 PB/EE OUT | 433-5 | AU-49, 19-5

AU-51A
1-611-950-21
BVU-150P
BVU-150

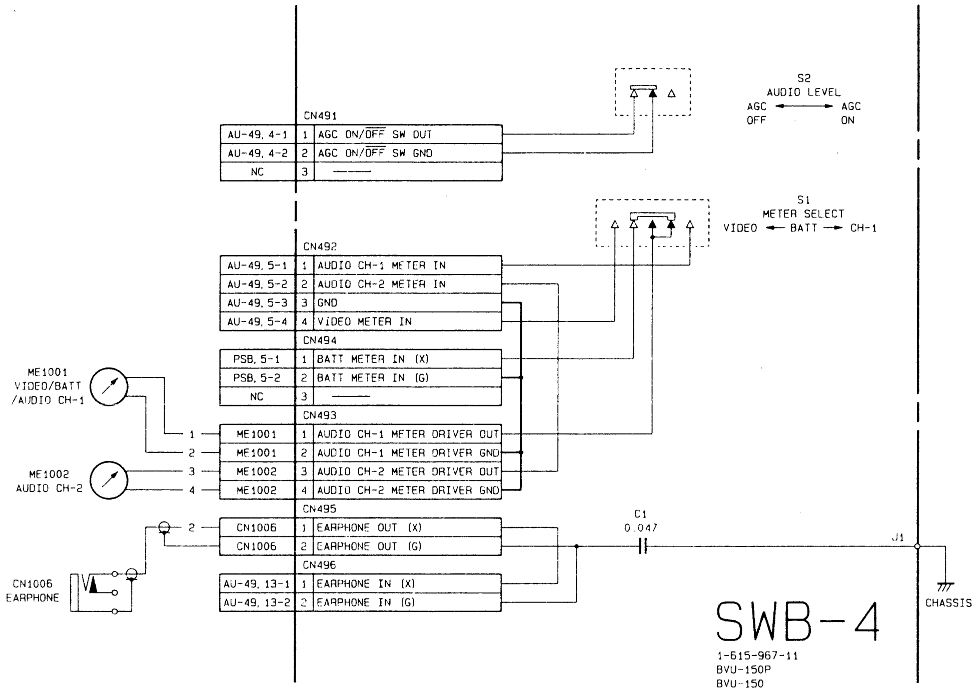
CM-19A (CAMERA/MIC INPUT SELECT)



DUS-70 (CAMERA INPUT)

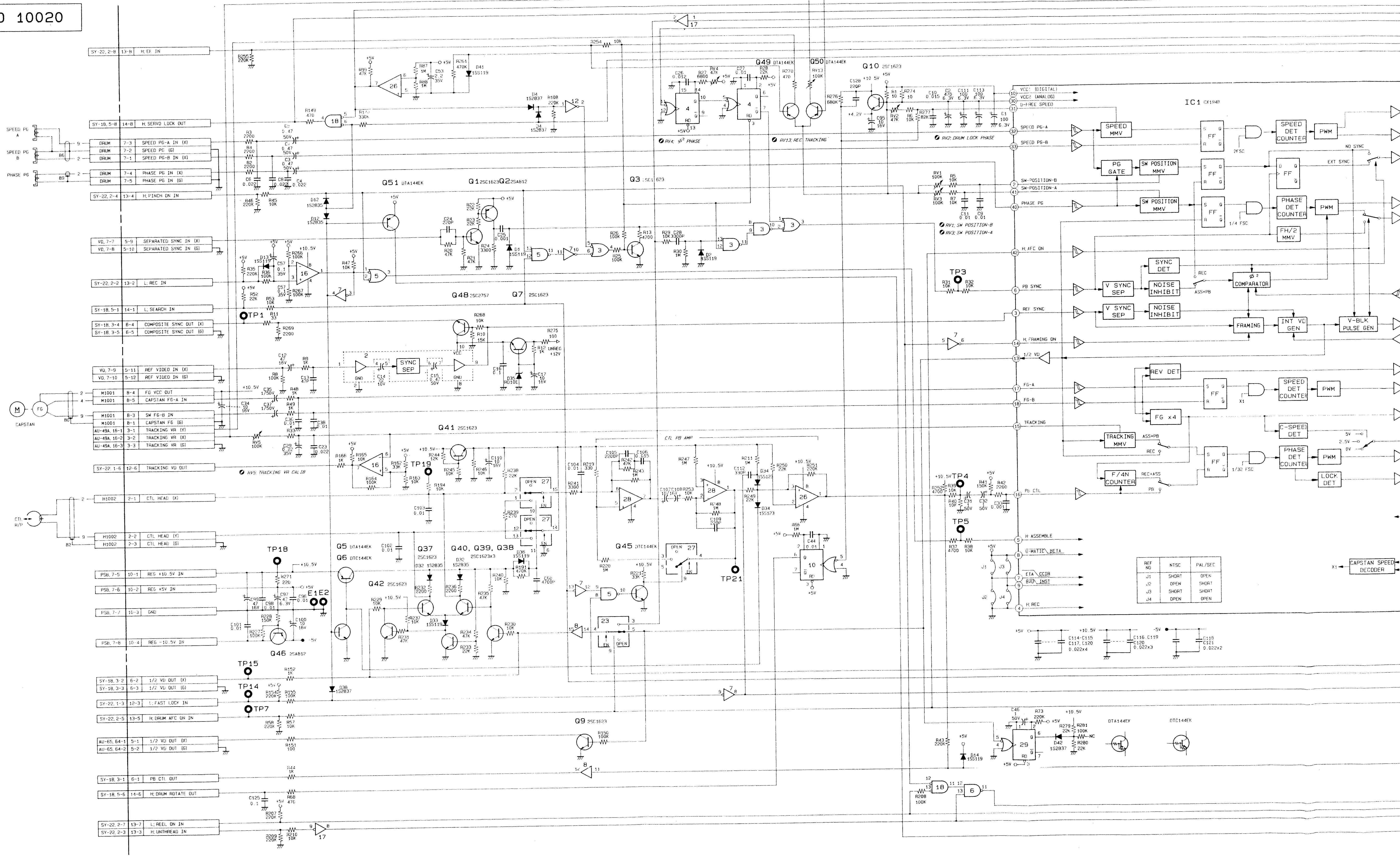

CN82
PSB, 4-1 | 1 | CAMERA +12V IN
PSB, 4-2 | 2 | CAMERA +12V IN
PSB, 4-3 | 3 | GND
PSB, 4-4 | 4 | GND
CN83
CM, 75-1 | 1 | CAMERA MIC OUT (X)
CM, 75-2 | 2 | CAMERA MIC OUT (Y)
CM, 75-3 | 3 | CAMERA MIC OUT (G)
CM, 75-4 | 4 | LINE/$\overline{\text{CAMERA}}$ IN
NC | 5 | ———
CN81
SY-18, 15-1 | 1 | START/$\overline{\text{STOP}}$ OUT
SY-18, 15-2 | 2 | REC TALLY IN
SY-18, 15-3 | 3 | BATT ALARM IN
SY-18, 15-4 | 4 | VTR SAVE OUT
SY-18, 15-5 | 5 | LINE/$\overline{\text{CAMERA}}$ OUT
KY, 6-2 | 6 | FRAMING PULSE OUT
CN84
VO, 8-3 | 3 | CAMERA VIDEO IN (X)
VO, 8-2 | 2 | CAMERA VIDEO IN (G)
NC | 1 | ———
CN85
VO, 17-2 | 2 | VIDEO OUT (X)
VO, 17-1 | 3 | VIDEO OUT (G)
NC | 1 | ———
R1
75
1 2 3 4 5 6 7 8 9 10 11 12 13 14
CN1005
1 GND
2 +12V OUT
3 CAMERA MIC IN (X)
4 CAMERA MIC IN (Y)
5 CAMERA MIC IN (G)
6 CAMERA VIDEO IN (X)
7 CAMERA VIDEO IN (G)
8 CAMERA VIDEO OUT (G)
9 CAMERA VIDEO OUT (X)
10 BATT ALARM OUT
11 FRAMING PULSE IN
12 REC TALLY OUT
13 START/$\overline{\text{STOP}}$ IN
14 VTR SAVE IN
2 1 5 3 6 9 12 10 14 13
CAMERA
-EXT VIEW-
LINE
VIDEO IN
DUS-70
1-615-977-11
BVU-150P
BVU-150

SWB-4 (AUDIO LEVEL/METER SELECT)

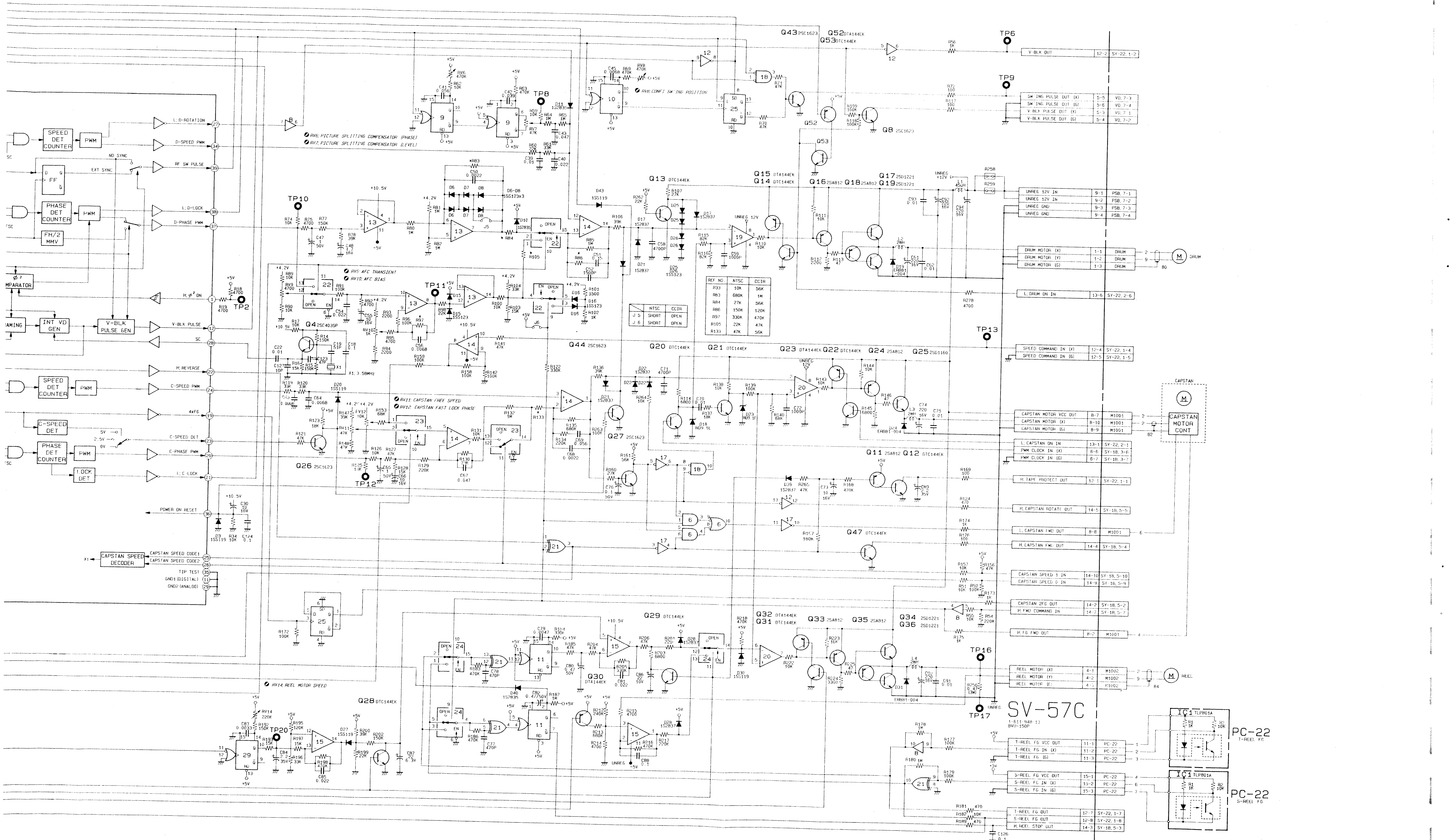


V-57C (DRUM/CAPSTAN/REEL SERVO)
C-22 (S/T-REEL FG GEN.)

S/N; UP TO 10020



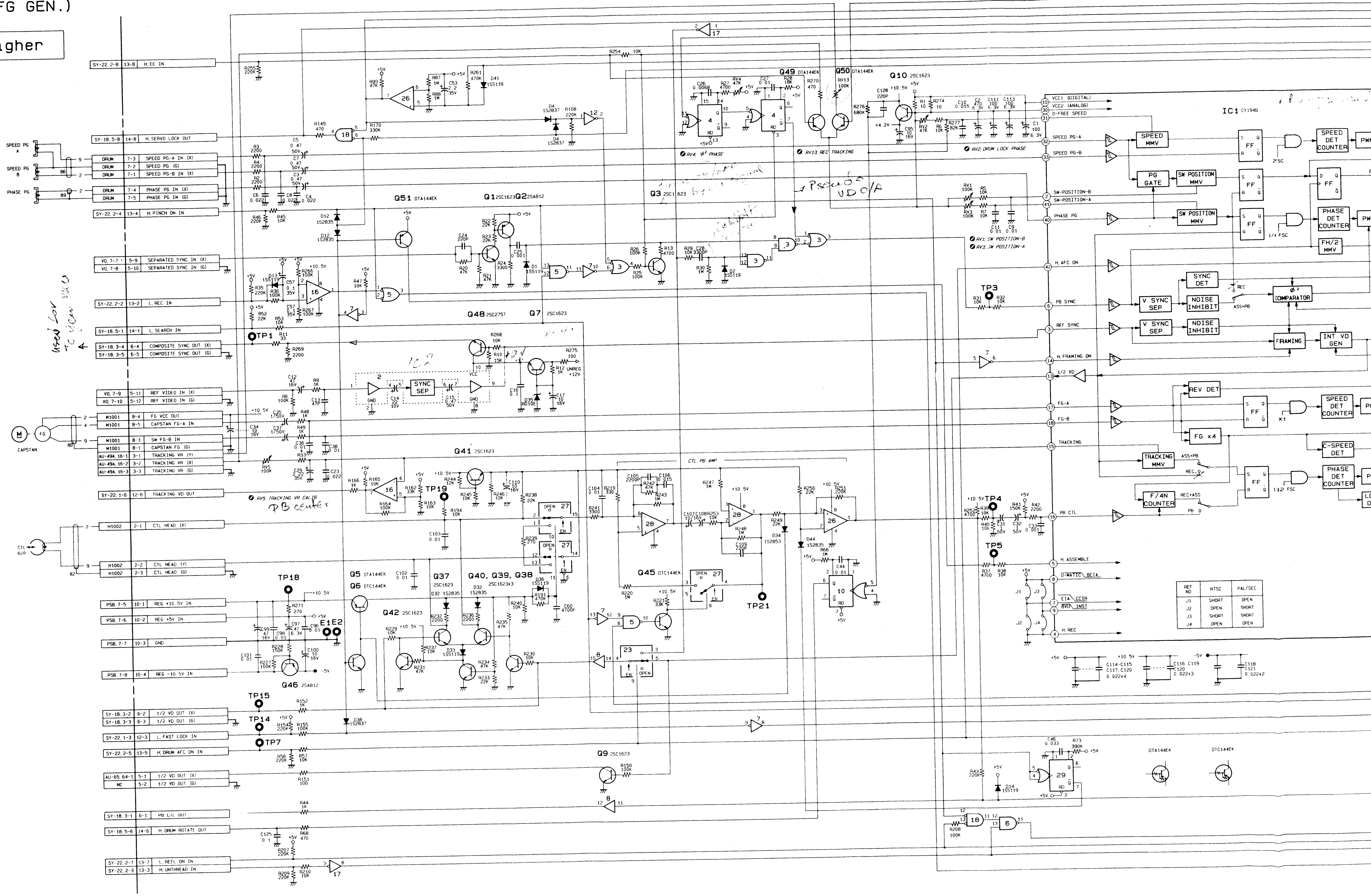
REF NO	NTSC	PAL/SEC
J1	SHORT	OPEN
J2	OPEN	SHORT
J3	SHORT	SHORT
J4	OPEN	OPEN


SPEED DET COUNTER
PWM
PHASE DET COUNTER
FF
FH/2 MMV
COMPARATOR
INT VD GEN
V-BLK PULSE GEN
C-SPEED DET
LOCK DET
CAPSTAN SPEED DECODER
L D-ROTATION
D-SPEED PWM
RF SW PULSE
NO SYNC
EXT SYNC
L D-LOCK
D-PHASE PWM
H φ² ON
V-BLK PULSE
SC
H REVERSE
C-SPEED PWM
4xF6
C-SPEED DET
C-PHASE PWM
L C-LOCK
POWER ON RESET
CAPSTAN SPEED CODE1
CAPSTAN SPEED CODE2
TIP TEST
GND1 (DIGITAL)
GND2 (ANALOG)
TP2
TP6
TP8
TP9
TP10
TP11
TP12
TP13
TP16
TP17
TP20
RV6 PICTURE SPLITTING COMPENSATOR (PHASE)
RV7 PICTURE SPLITTING COMPENSATOR (LEVEL)
RV8 CONFI SW'ING POSITION
RV5 AFC TRANSIENT
RV10 AFC BIAS
RV11 CAPSTAN FREE SPEED
RV12 CAPSTAN FAST LOCK PHASE
RV14 REEL MOTOR SPEED
Q43 2SC1623
Q52 DTA144EK
Q53 DTC144EK
Q8 2SC1623
Q13 DTC144EK
Q15 DTA144EK
Q14 DTC144EK
Q16 2SA812
Q18 2SA812
Q17 2SD1221
Q19 2SD1221
Q4 2SC403SP
Q44 2SC1623
Q20 DTC144EK
Q21 DTC144EK
Q23 DTA144EK
Q22 DTC144EK
Q24 2SA812
Q25 2SD1160
Q26 2SC1623
Q27 2SC1623
Q11 2SA812
Q12 DTC144EK
Q47 DTC144EK
Q29 DTC144EK
Q32 DTA144EK
Q31 DTC144EK
Q33 2SA812
Q35 2SA812
Q34 2SD1221
Q36 2SD1221
Q28 DTC144EK
Q30 DTA144EK
X1 3.58MHz
REF NO. | NTSC | CCIR
R83 | 10K | 56K
R83 | 680K | 1M
R84 | 27K | 56K
R86 | 150K | 120K
R97 | 330K | 470K
R105 | 22K | 47K
R133 | 47K | 56K
NTSC | CCIR
J5 | SHORT | OPEN
J6 | SHORT | OPEN
V-BLK OUT 12-2 SY-22, 1-2
SW'ING PULSE OUT (X) 5-5 VO, 7-3
SW'ING PULSE OUT (G) 5-6 VO, 7-4
V-BLK PULSE OUT (X) 5-3 VO, 7-1
V-BLK PULSE OUT (G) 5-4 VO, 7-2
UNREG 12V IN 9-1 PSB, 7-1
UNREG 12V IN 9-2 PSB, 7-2
UNREG GND 9-3 PSB, 7-3
UNREG GND 9-4 PSB, 7-4
DRUM MOTOR (X) 1-1 DRUM
DRUM MOTOR (Y) 1-2 DRUM
DRUM MOTOR (G) 1-3 DRUM
M DRUM
L DRUM ON IN 13-6 SY-22, 2-6
SPEED COMMAND IN (X) 12-4 SY-22, 1-4
SPEED COMMAND IN (G) 12-5 SY-22, 1-5
CAPSTAN
CAPSTAN MOTOR CONT
CAPSTAN MOTOR VCC OUT 8-7 M1001
CAPSTAN MOTOR (X) 8-10 M1001
CAPSTAN MOTOR (G) 8-9 M1001
L CAPSTAN ON IN 13-1 SY-22, 2-1
PWM CLOCK IN (X) 6-6 SY-18, 3-6
PWM CLOCK IN (G) 6-7 SY-18, 3-7
H TAPE PROTECT OUT 12-1 SY-22, 1-1
H CAPSTAN ROTATE OUT 14-5 SY-18, 5-5
L CAPSTAN FWD OUT 8-8 M1001
H CAPSTAN FWD OUT 14-4 SY-18, 5-4
CAPSTAN SPEED 1 IN 14-10 SY-18, 5-10
CAPSTAN SPEED 0 IN 14-9 SY-18, 5-9
CAPSTAN 2FG OUT 14-2 SY-18, 5-2
H FWD COMMAND IN 14-7 SY-18, 5-7
H FG FWD OUT 8-7 M1001
REEL MOTOR (X) 4-1 M1002
REEL MOTOR (Y) 4-2 M1002
REEL MOTOR (G) 4-3 M1002
M REEL
SV-57C
1-611-948-13
BVU-150P
T-REEL FG VCC OUT 11-1 PC-22
T-REEL FG IN (X) 11-2 PC-22
T-REEL FG (G) 11-3 PC-22
S-REEL FG VCC OUT 15-1 PC-22
S-REEL FG IN (X) 15-2 PC-22
S-REEL FG IN (G) 15-3 PC-22
T-REEL FG OUT 12-7 SY-22, 1-7
S-REEL FG OUT 12-8 SY-22, 1-8
H REEL STOP OUT 14-3 SY-18, 5-3
IC1 TLP801A
PC-22
T-REEL FG
S-REEL FG
UNREG

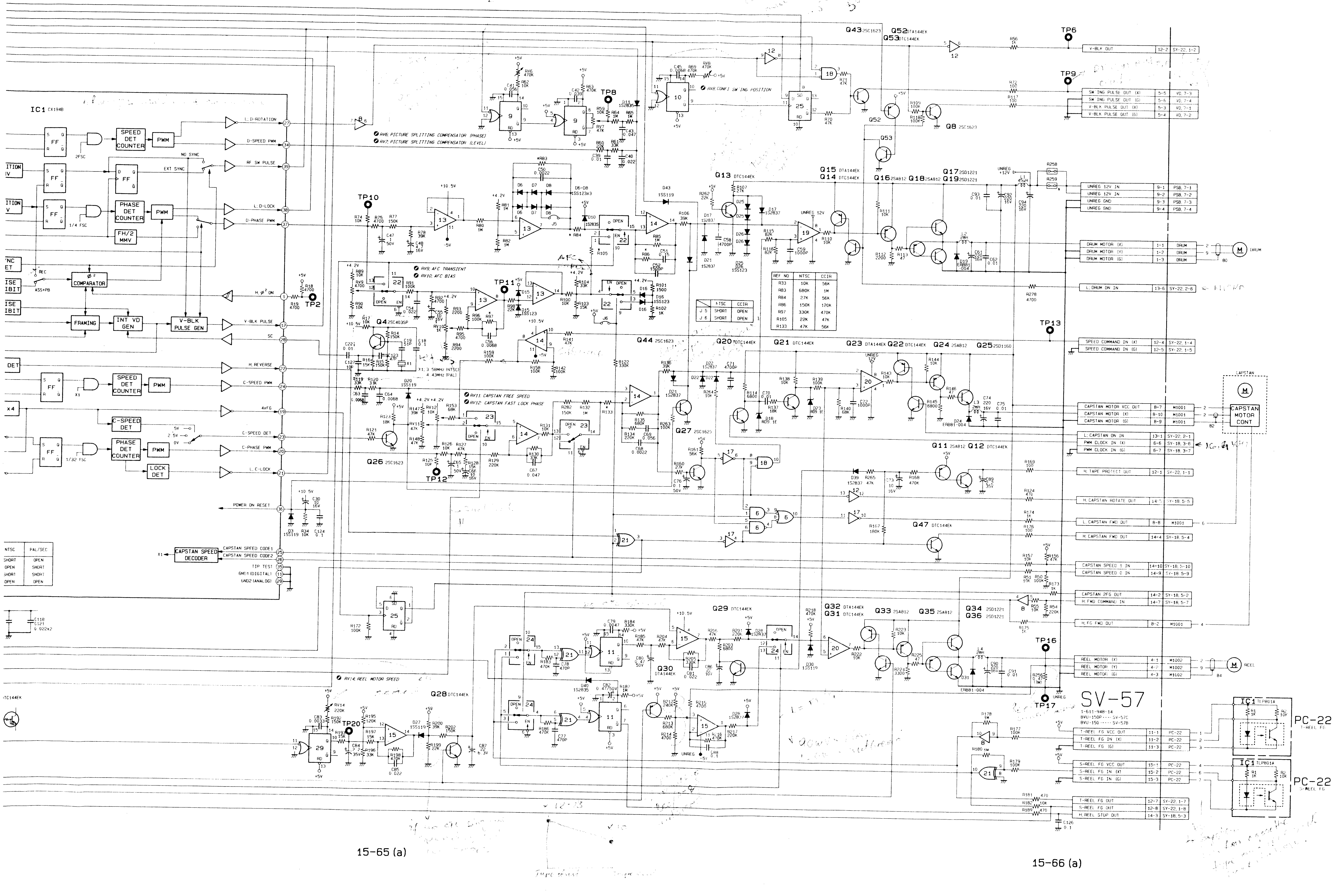
[illegible] Cal used [illegible] REC [illegible] 29 [illegible] only [illegible] mode

V-57C (DRUM/CAPSTAN/REEL SERVO)
PC-22 (S/T-REEL FG GEN.)

S/N; 10021 and higher



REF NO	NTSC	PAL/SEC
J1	SHORT	OPEN
J2	OPEN	SHORT
J3	SHORT	SHORT
J4	OPEN	OPEN



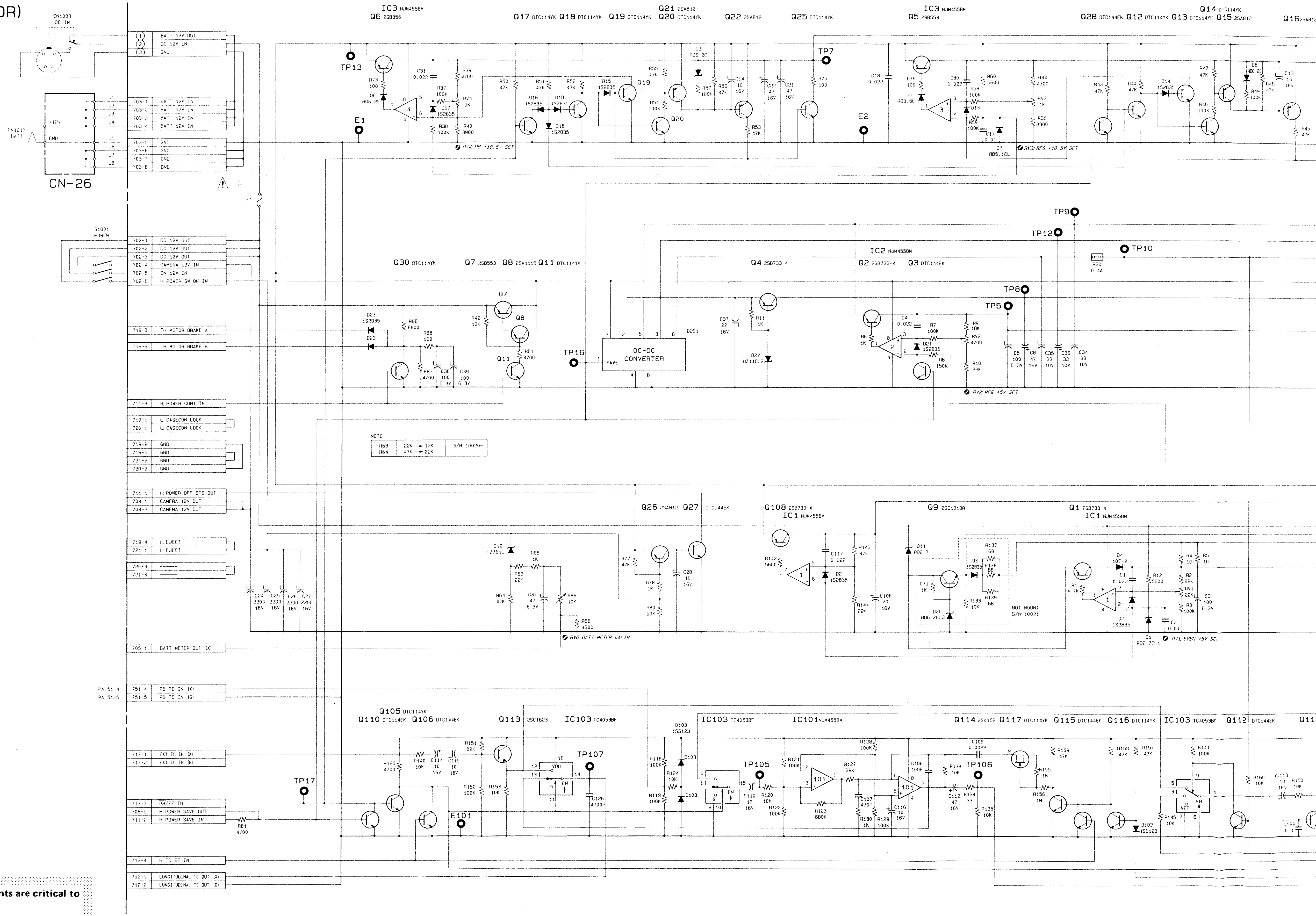
	NTSC	PAL/SEC
	SHORT	OPEN
	OPEN	SHORT
	SHORT	SHORT
	OPEN	OPEN

	NTSC	CCIR
J 5	SHORT	OPEN
J 6	SHORT	OPEN

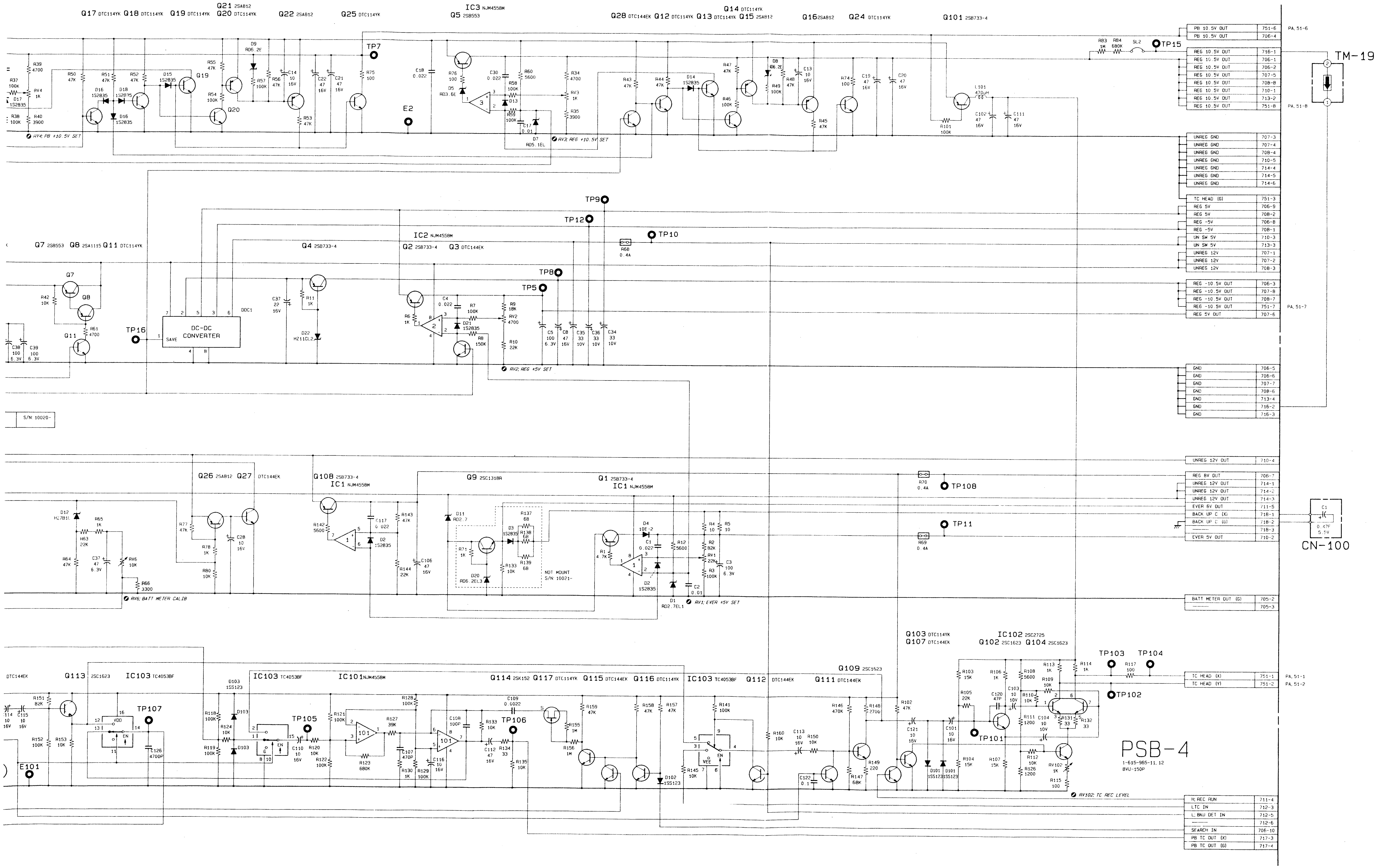
REF NO	NTSC	CCIR
R33	10K	56K
R83	680K	1M
R84	27K	56K
R86	150K	120K
R97	330K	470K
R105	22K	47K
R133	47K	56K

PSB-4 (POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26 (DC IN CONNECTOR)
CN-100 (BACK UP CAPACITOR)
TM-19 (HOURS METER)

S/N; UP TO 10120

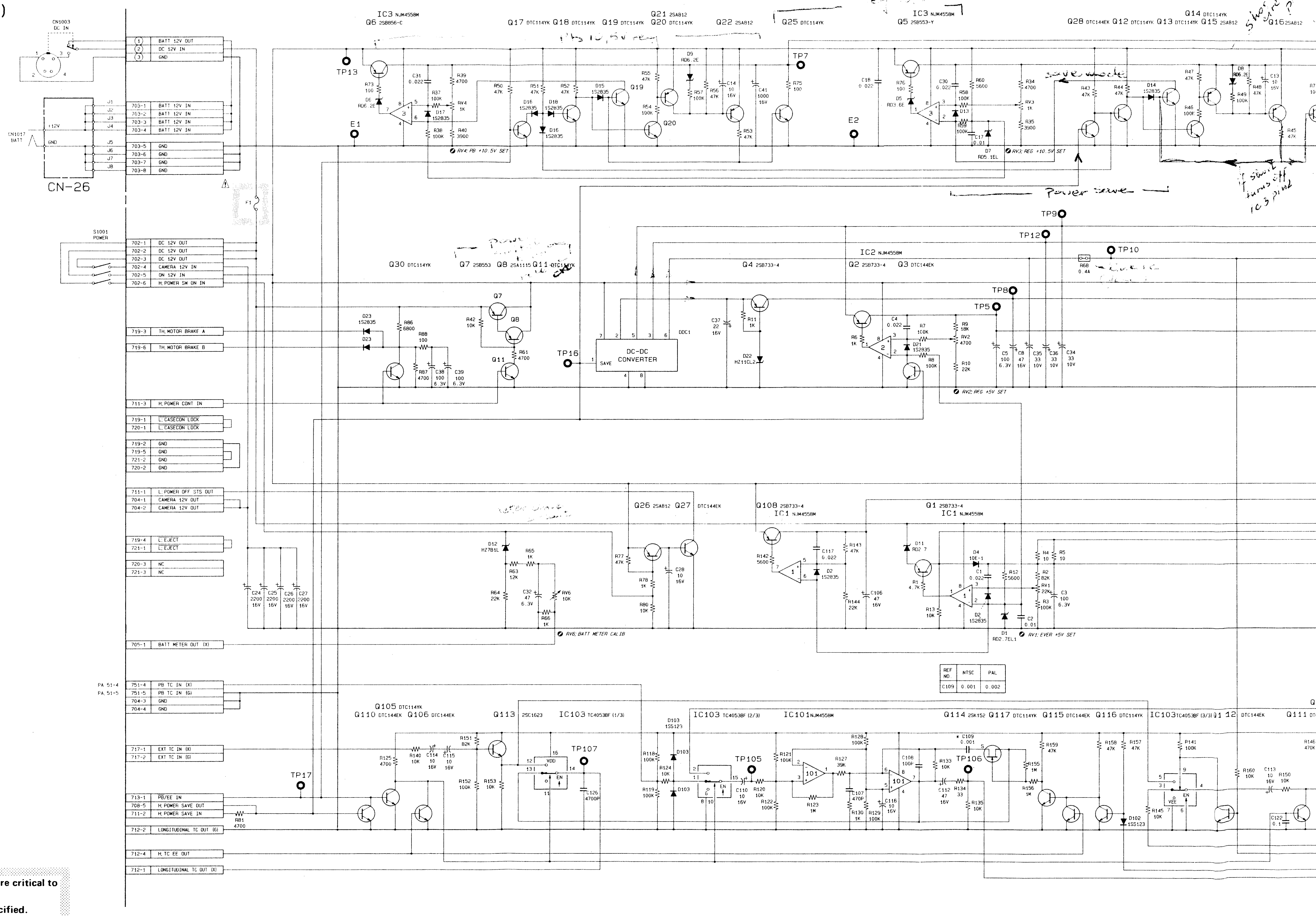


NOTE: The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.


Q17 DTC114YK Q18 DTC114YK Q19 DTC114YK Q20 DTC114YK
Q21 2SA812
Q22 2SA812
Q25 DTC114YK
IC3 NJM4558M
Q5 2SB553
Q28 DTC144EK Q12 DTC114YK Q13 DTC114YK Q15 2SA812
Q14 DTC114YK
Q16 2SA812 Q24 DTC114YK
Q101 2SB733-4
TP7
TP15
E2
RV4; PB +10.5V SET
RV3; REG +10.5V SET
TM-19
PB 10.5V OUT
REG 10.5V OUT
UNREG GND
TC HEAD (G)
REG 5V
REG -5V
UN SW 5V
UNREG 12V
REG -10.5V OUT
REG 5V OUT
GND
PA, 51-6
PA, 51-8
PA, 51-7
TP9
TP12
TP10
TP8
TP5
TP16
Q7 2SB553 Q8 2SA1115 Q11 DTC114YK
Q4 2SB733-4
IC2 NJM4558M
Q2 2SB733-4 Q3 DTC144EK
DC-DC CONVERTER
DDC1
SAVE
RV2; REG +5V SET
S/N 10020-
Q26 2SA812 Q27 DTC144EK
Q108 2SB733-4
IC1 NJM4558M
Q9 2SC1318A
Q1 2SB733-4
IC1 NJM4558M
NOT MOUNT S/N 10021-
RV6; BATT METER CALIB
RV1; EVER +5V SET
TP108
TP11
UNREG 12V OUT
REG 8V OUT
UNREG 12V OUT
EVER 6V OUT
BACK UP C (X)
BACK UP C (G)
EVER 5V OUT
CN-100
BATT METER OUT (G)
Q113 2SC1623
IC103 TC4053BF
IC101 NJM4558M
Q114 2SK152 Q117 DTC114YK Q115 DTC144EK Q116 DTC114YK
IC103 TC4053BF Q112 DTC144EK
Q111 DTC144EK
Q109 2SC1623
Q103 DTC114YK
Q107 DTC144EK
IC102 2SC2725
Q102 2SC1623 Q104 2SC1623
TP103
TP104
TP102
TP101
TP107
TP105
TP106
E101
TC HEAD (X)
TC HEAD (Y)
PA, 51-1
PA, 51-2
PSB-4
1-615-965-11, 12
BVU-150P
RV102; TC REC LEVEL
H; REC RUN
LTC IN
L; BKU DET IN
SEARCH IN
PB TC OUT (X)
PB TC OUT (G)

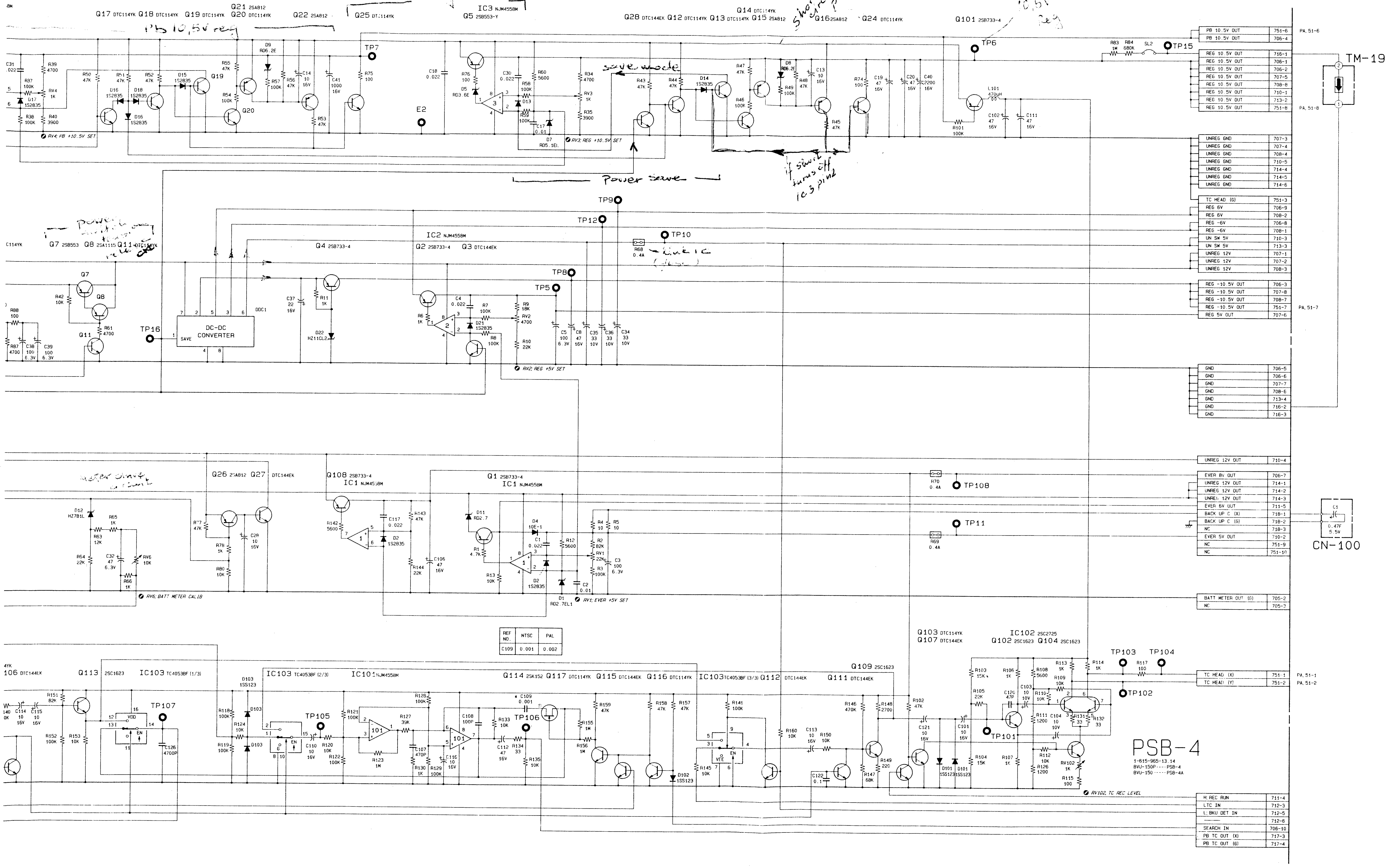
PSB-4 (POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26 (DC IN CONNECTOR)
CN-100 (BACK UP CAPACITOR)
TM-19 (HOURS METER)

S/N; 10121 and higher



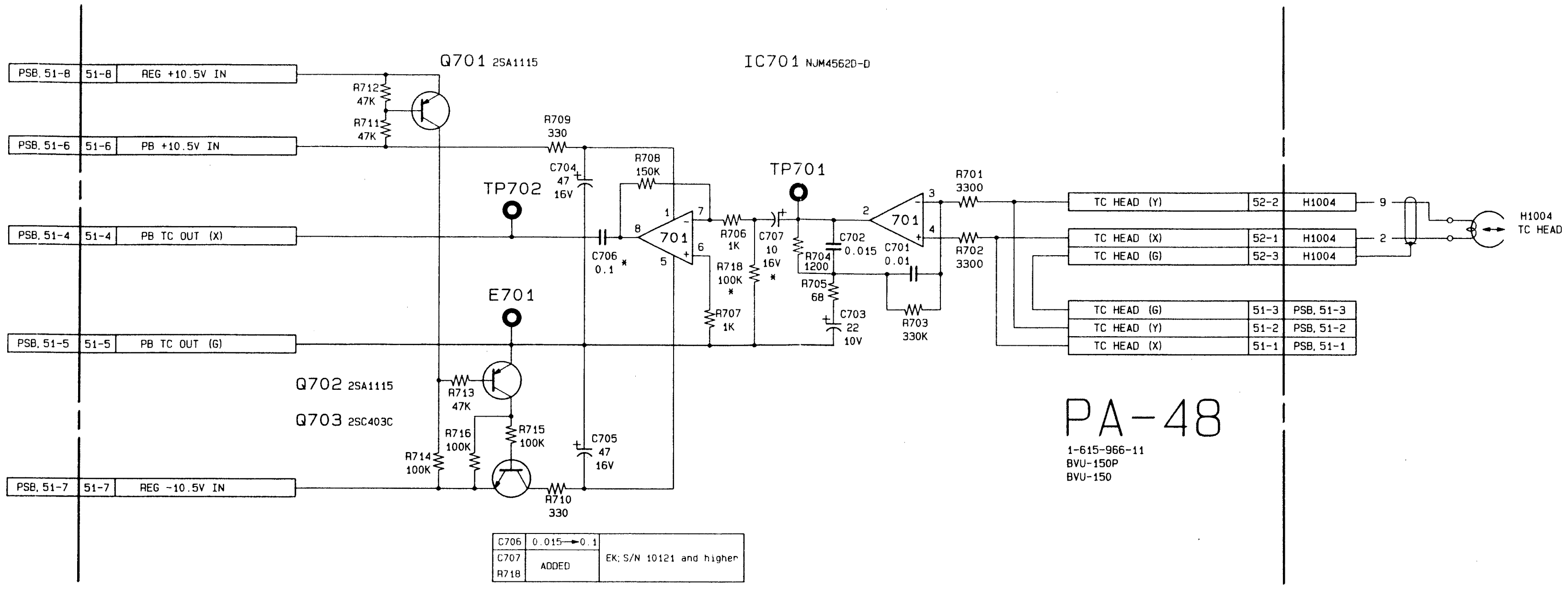
REF NO	NTSC	PAL
C109	0.001	0.002

NOTE: The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.



REF NO.	NTSC	PAL
C109	0.001	0.002

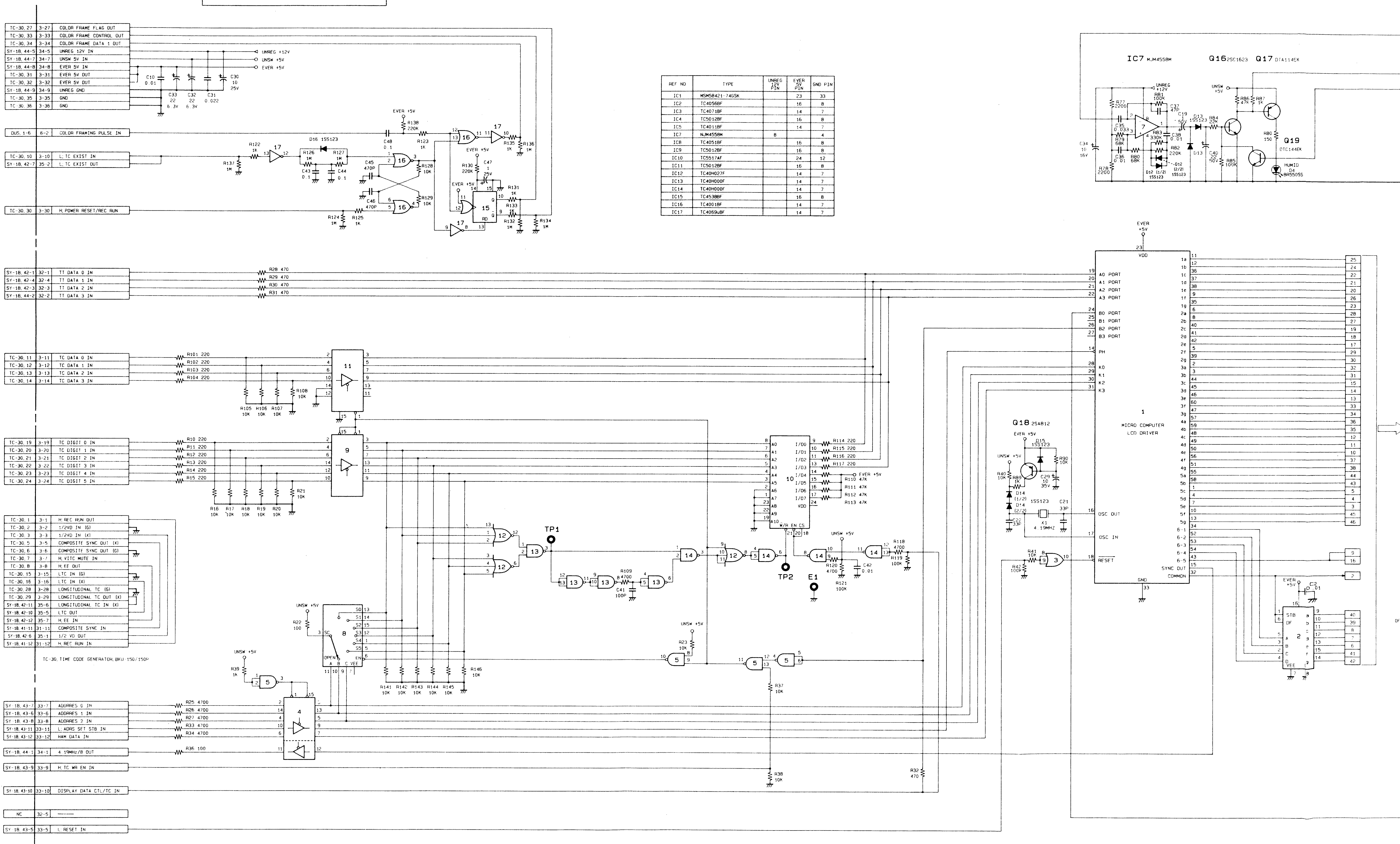
PA-48 (TIME CODE PB AMPLIFIER)



C706	0.015→0.1	EK; S/N 10121 and higher
C707 R718	ADDED	

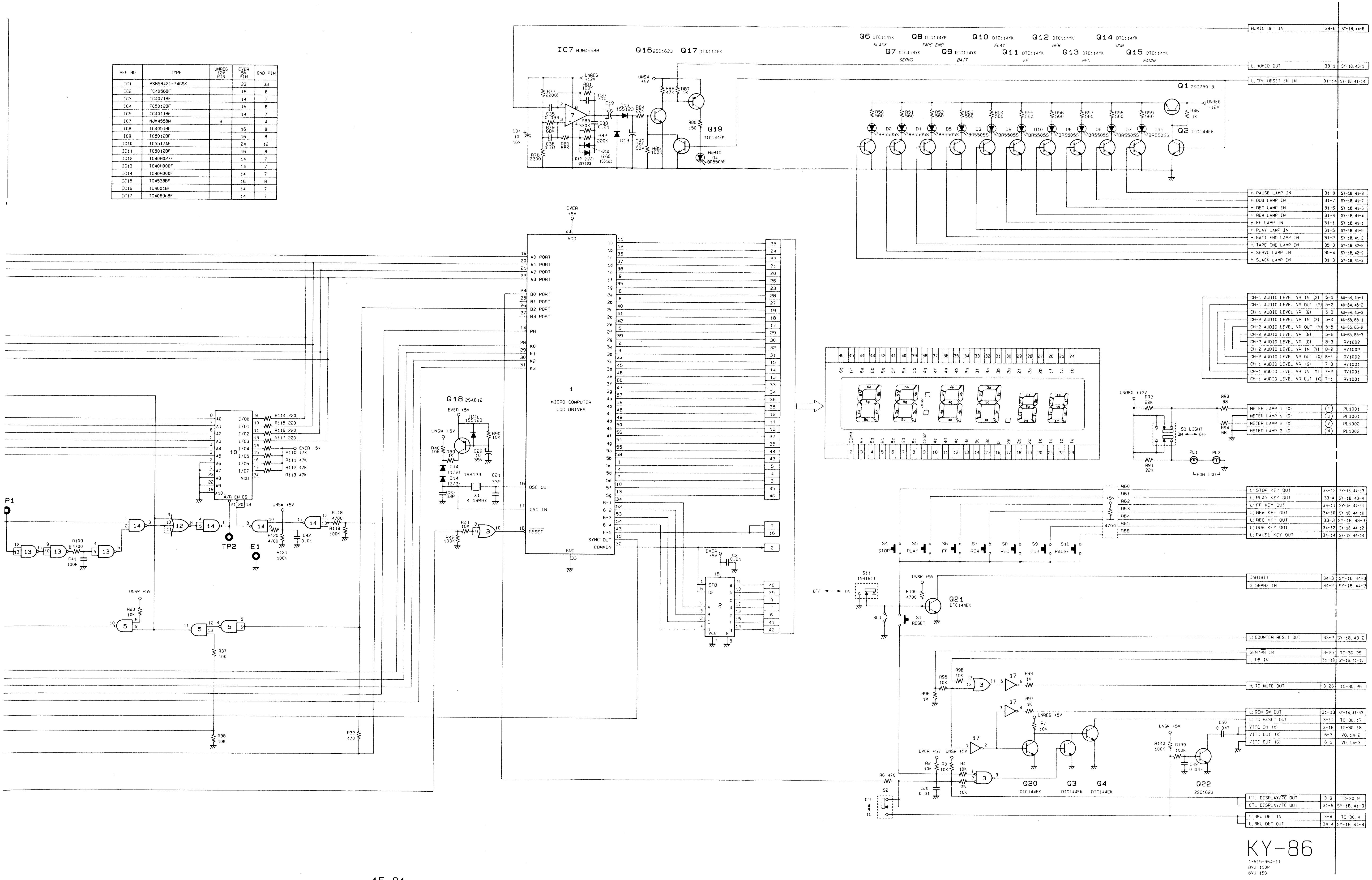
KY-86 (FUNCTION KEY/DISPLAY)

S/N; UP TO 10190

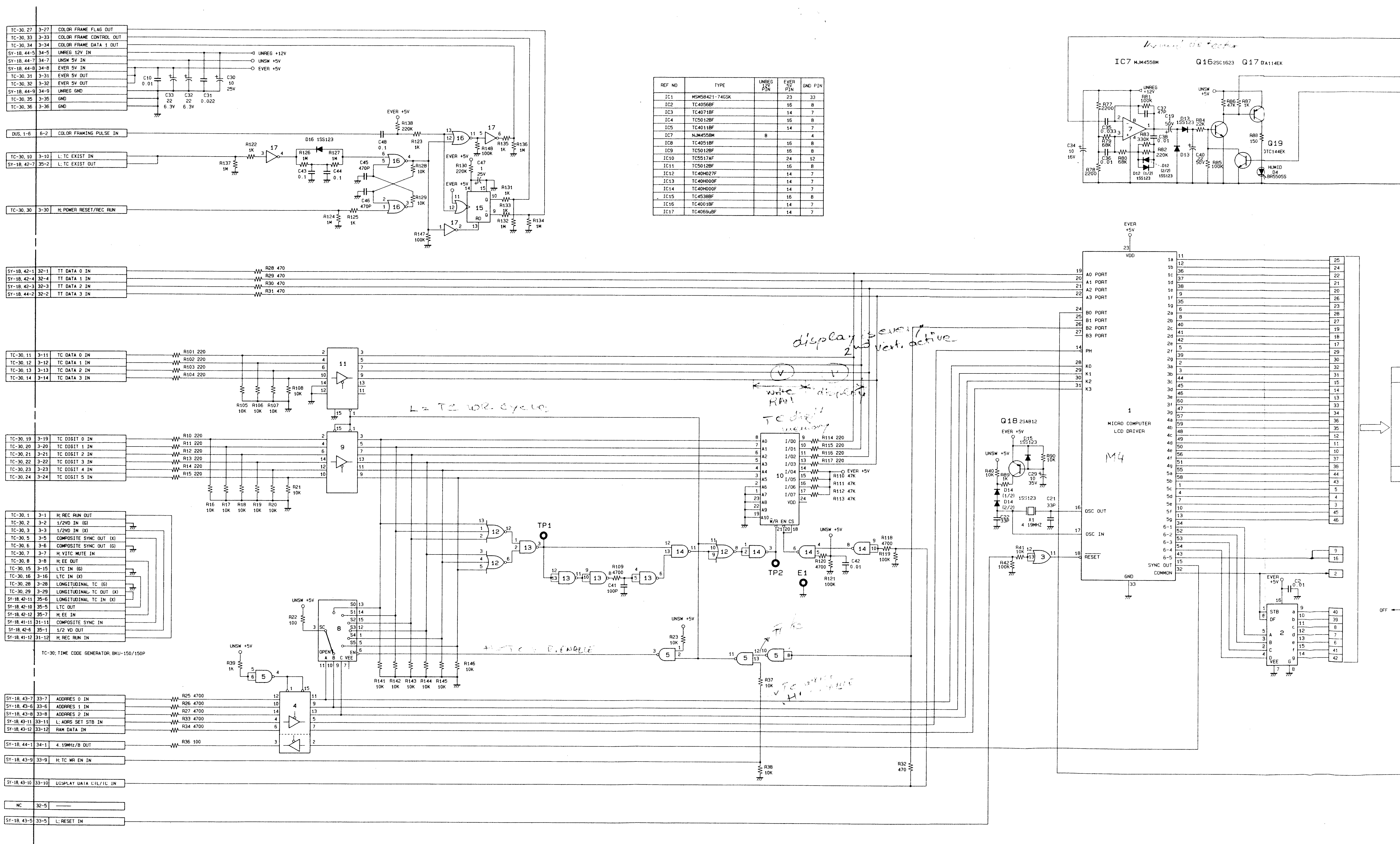

TC-30, 27 | 3-27 | COLOR FRAME FLAG OUT
TC-30, 33 | 3-33 | COLOR FRAME CONTROL OUT
TC-30, 34 | 3-34 | COLOR FRAME DATA 1 OUT
SY-18, 44-5 | 34-5 | UNREG 12V IN
SY-18, 44-7 | 34-7 | UNSW 5V IN
SY-18, 44-8 | 34-8 | EVER 5V IN
TC-30, 31 | 3-31 | EVER 5V OUT
TC-30, 32 | 3-32 | EVER 5V OUT
SY-18, 44-9 | 34-9 | UNREG GND
TC-30, 35 | 3-35 | GND
TC-30, 36 | 3-36 | GND
DUS, 1-6 | 6-2 | COLOR FRAMING PULSE IN
TC-30, 10 | 3-10 | L; TC EXIST IN
SY-18, 42-7 | 35-2 | L; TC EXIST OUT
TC-30, 30 | 3-30 | H; POWER RESET/REC RUN
SY-18, 42-1 | 32-1 | TT DATA 0 IN
SY-18, 42-4 | 32-4 | TT DATA 1 IN
SY-18, 42-3 | 32-3 | TT DATA 2 IN
SY-18, 44-2 | 32-2 | TT DATA 3 IN
TC-30, 11 | 3-11 | TC DATA 0 IN
TC-30, 12 | 3-12 | TC DATA 1 IN
TC-30, 13 | 3-13 | TC DATA 2 IN
TC-30, 14 | 3-14 | TC DATA 3 IN
TC-30, 19 | 3-19 | TC DIGIT 0 IN
TC-30, 20 | 3-20 | TC DIGIT 1 IN
TC-30, 21 | 3-21 | TC DIGIT 2 IN
TC-30, 22 | 3-22 | TC DIGIT 3 IN
TC-30, 23 | 3-23 | TC DIGIT 4 IN
TC-30, 24 | 3-24 | TC DIGIT 5 IN
TC-30, 1 | 3-1 | H; REC RUN OUT
TC-30, 2 | 3-2 | 1/2VD IN (G)
TC-30, 3 | 3-3 | 1/2VD IN (X)
TC-30, 5 | 3-5 | COMPOSITE SYNC OUT (X)
TC-30, 6 | 3-6 | COMPOSITE SYNC OUT (G)
TC-30, 7 | 3-7 | H; VITC MUTE IN
TC-30, 8 | 3-8 | H; EE OUT
TC-30, 15 | 3-15 | LTC IN (G)
TC-30, 16 | 3-16 | LTC IN (X)
TC-30, 28 | 3-28 | LONGITUDINAL TC (G)
TC-30, 29 | 3-29 | LONGITUDINAL TC OUT (X)
SY-18, 42-11 | 35-6 | LONGITUDINAL TC IN (X)
SY-18, 42-10 | 35-5 | LTC OUT
SY-18, 42-12 | 35-7 | H; EE IN
SY-18, 41-11 | 31-11 | COMPOSITE SYNC IN
SY-18, 42-6 | 35-1 | 1/2 VD OUT
SY-18, 41-12 | 31-12 | H, REC RUN IN
TC-30, TIME CODE GENERATOR, BKU-150/150P
SY-18, 43-7 | 33-7 | ADDRRES 0 IN
SY-18, 43-6 | 33-6 | ADDRRES 1 IN
SY-18, 43-8 | 33-8 | ADDRRES 2 IN
SY-18, 43-11 | 33-11 | L; ADRS SET STB IN
SY-18, 43-12 | 33-12 | RAM DATA IN
SY-18, 44-1 | 34-1 | 4.19MHz/8 OUT
SY-18, 43-9 | 33-9 | H; TC WR EN IN
SY-18, 43-10 | 33-10 | DISPLAY DATA CTL/TC IN
NC | 32-5 | ———
SY-18, 43-5 | 33-5 | L; RESET IN
UNREG +12V
UNSW +5V
EVER +5V
D16 1SS123
TP1
TP2
E1
IC7 NJM4558M
Q16 2SC1623
Q17 DTA114EK
Q19 DTC144EK
Q18 2SA812
D15 1SS123
X1 4.19MHZ
HUMID D4 BR5505S
1 MICRO COMPUTER LCD DRIVER
A0 PORT
A1 PORT
A2 PORT
A3 PORT
B0 PORT
B1 PORT
B2 PORT
B3 PORT
PH
K0
K1
K2
K3
OSC OUT
OSC IN
RESET
VDD
GND
SYNC OUT
COMMON
STB
DF
VEE

REF NO	TYPE	UNREG 12V PIN	EVER 5V PIN	GND PIN
IC1	MSM58421-74GSK		23	33
IC2	TC4056BF		16	8
IC3	TC4071BF		14	7
IC4	TC5012BF		16	8
IC5	TC4011BF		14	7
IC7	NJM4558M	8		4
IC8	TC4051BF		16	8
IC9	TC5012BF		16	8
IC10	TC5517AF		24	12
IC11	TC5012BF		16	8
IC12	TC40H027F		14	7
IC13	TC40H000F		14	7
IC14	TC40H000F		14	7
IC15	TC4538BF		16	8
IC16	TC4001BF		14	7
IC17	TC4069uBF		14	7

REF NO	TYPE	UNREG 12V PIN	EVER 5V PIN	GND PIN
IC1	MSM58421-74GSK		23	33
IC2	TC4056BF		16	8
IC3	TC4071BF		14	7
IC4	TC5012BF		16	8
IC5	TC4011BF		14	7
IC7	NJM4558M	8		4
IC8	TC4051BF		16	8
IC9	TC5012BF		16	8
IC10	TC5517AF		24	12
IC11	TC5012BF		16	8
IC12	TC40H027F		14	7
IC13	TC40H000F		14	7
IC14	TC40H000F		14	7
IC15	TC4538BF		16	8
IC16	TC4001BF		14	7
IC17	TC4069uBF		14	7

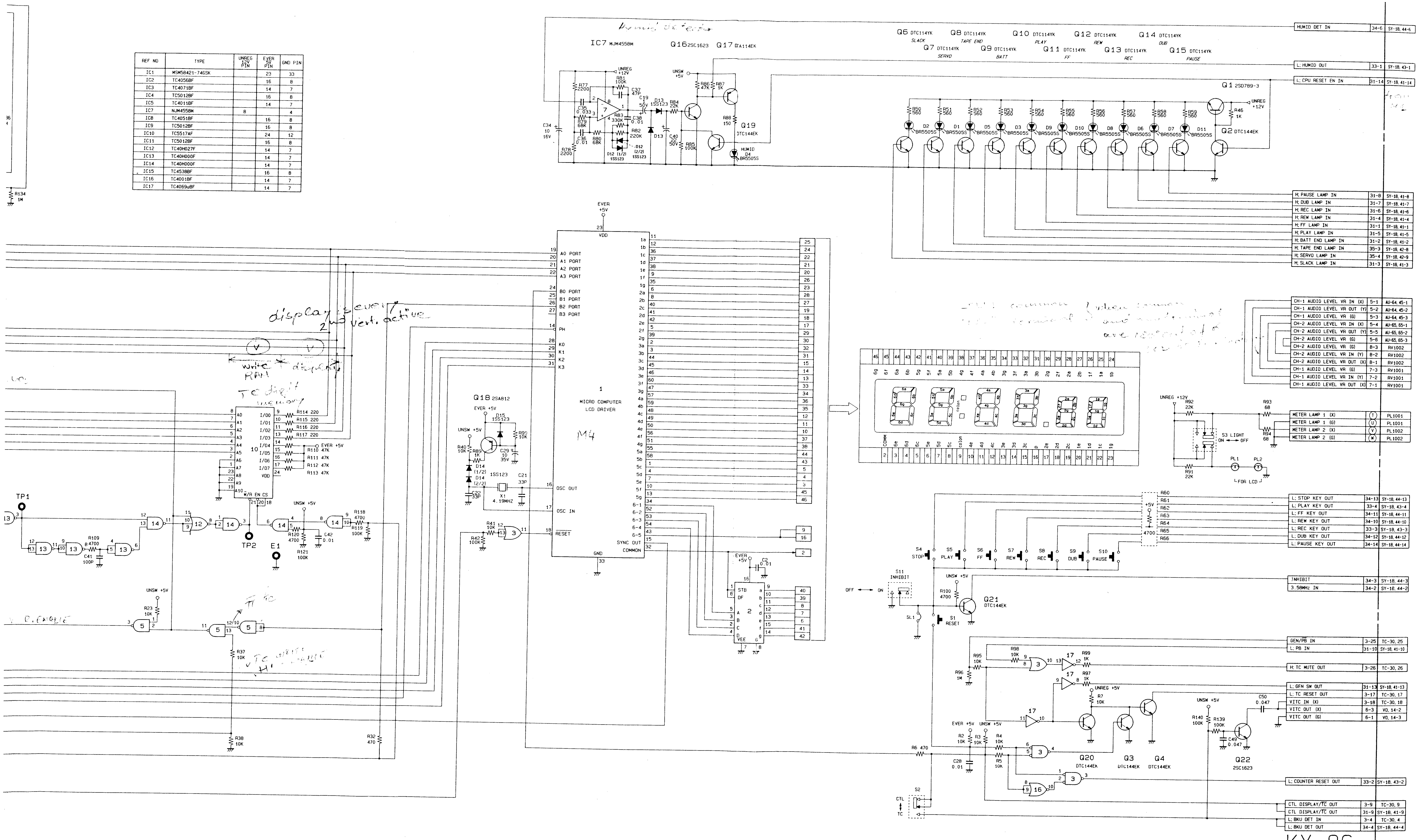

IC7 MJM4558M
Q16 2SC1623
Q17 DTA114EK
Q19 DTC144EK
HUMID D4 BA5505S
Q6 DTC114YK SLACK
Q7 DTC114YK SERVO
Q8 DTC114YK TAPE END
Q9 DTC114YK BATT
Q10 DTC114YK PLAY
Q11 DTC114YK FF
Q12 DTC114YK REW
Q13 DTC114YK REC
Q14 DTC114YK DUB
Q15 DTC114YK PAUSE
Q1 2SD789-3
Q2 DTC144EK
UNREG +12V
UNSW +5V
EVER +5V
1 MICRO COMPUTER LCD DRIVER
VDD
A0 PORT
A1 PORT
A2 PORT
A3 PORT
B0 PORT
B1 PORT
B2 PORT
B3 PORT
PH
K0
K1
K2
K3
OSC OUT
OSC IN
RESET
SYNC OUT
COMMON
GND
Q18 2SA812
X1 4.19MHz
10
W/R EN CS
2
STB
DF
VEE
P1
TP2
E1
S4 STOP
S5 PLAY
S6 FF
S7 REW
S8 REC
S9 DUB
S10 PAUSE
S11 INHIBIT
OFF ON
S1 RESET
SL1
Q21 DTC144EK
S2
CTL
TC
S3 LIGHT
ON OFF
PL1
PL2
FOR LCD
Q20 DTC144EK
Q3 DTC144EK
Q4 DTC144EK
Q22 2SC1623
HUMID DET IN 34-6 SY-18, 44-6
L; HUMID OUT 33-1 SY-18, 43-1
L; CPU RESET EN IN 31-14 SY-18, 41-14
H; PAUSE LAMP IN 31-8 SY-18, 41-8
H; DUB LAMP IN 31-7 SY-18, 41-7
H; REC LAMP IN 31-6 SY-18, 41-6
H; REW LAMP IN 31-4 SY-18, 41-4
H; FF LAMP IN 31-1 SY-18, 41-1
H; PLAY LAMP IN 31-5 SY-18, 41-5
H; BATT END LAMP IN 31-2 SY-18, 41-2
H; TAPE END LAMP IN 35-3 SY-18, 42-8
H; SERVO LAMP IN 35-4 SY-18, 42-9
H; SLACK LAMP IN 31-3 SY-18, 41-3
CH-1 AUDIO LEVEL VR IN (X) 5-1 AU-64, 45-1
CH-1 AUDIO LEVEL VR OUT (Y) 5-2 AU-64, 45-2
CH-1 AUDIO LEVEL VR (G) 5-3 AU-64, 45-3
CH-2 AUDIO LEVEL VR IN (X) 5-4 AU-65, 65-1
CH-2 AUDIO LEVEL VR OUT (Y) 5-5 AU-65, 65-2
CH-2 AUDIO LEVEL VR (G) 5-6 AU-65, 65-3
CH-2 AUDIO LEVEL VR (G) 8-3 RV1002
CH-2 AUDIO LEVEL VR IN (Y) 8-2 RV1002
CH-2 AUDIO LEVEL VR OUT (X) 8-1 RV1002
CH-1 AUDIO LEVEL VR (G) 7-3 RV1001
CH-1 AUDIO LEVEL VR IN (Y) 7-2 RV1001
CH-1 AUDIO LEVEL VR OUT (X) 7-1 RV1001
METER LAMP 1 (X) Ⓣ PL1001
METER LAMP 1 (G) Ⓤ PL1001
METER LAMP 2 (X) Ⓥ PL1002
METER LAMP 2 (G) Ⓦ PL1002
L; STOP KEY OUT 34-13 SY-18, 44-13
L; PLAY KEY OUT 33-4 SY-18, 43-4
L; FF KEY OUT 34-11 SY-18, 44-11
L; REW KEY OUT 34-10 SY-18, 44-10
L; REC KEY OUT 33-3 SY-18, 43-3
L; DUB KEY OUT 34-12 SY-18, 44-12
L; PAUSE KEY OUT 34-14 SY-18, 44-14
INHIBIT 34-3 SY-18, 44-3
3.58MHz IN 34-2 SY-18, 44-2
L; COUNTER RESET OUT 33-2 SY-18, 43-2
GEN/$\overline{PB}$ IN 3-25 TC-30, 25
L; PB IN 31-10 SY-18, 41-10
H; TC MUTE OUT 3-26 TC-30, 26
L; GEN SW OUT 31-13 SY-18, 41-13
L; TC RESET OUT 3-17 TC-30, 17
VITC IN (X) 3-18 TC-30, 18
VITC OUT (X) 6-3 VO, 14-2
VITC OUT (G) 6-1 VO, 14-3
CTL DISPLAY/$\overline{TC}$ OUT 3-9 TC-30, 9
CTL DISPLAY/$\overline{TC}$ OUT 31-9 SY-18, 41-9
L; BKU DET IN 3-4 TC-30, 4
L; BKU DET OUT 34-4 SY-18, 44-4
KY-86
1-615-964-11
BVU-150P
BVU-150

Y-86 (FUNCTION KEY/DISPLAY) S/N; 10191 and higher


TC-30, 27 | 3-27 | COLOR FRAME FLAG OUT
TC-30, 33 | 3-33 | COLOR FRAME CONTROL OUT
TC-30, 34 | 3-34 | COLOR FRAME DATA 1 OUT
SY-18, 44-5 | 34-5 | UNREG 12V IN
SY-18, 44-7 | 34-7 | UNSW 5V IN
SY-18, 44-8 | 34-8 | EVER 5V IN
TC-30, 31 | 3-31 | EVER 5V OUT
TC-30, 32 | 3-32 | EVER 5V OUT
SY-18, 44-9 | 34-9 | UNREG GND
TC-30, 35 | 3-35 | GND
TC-30, 36 | 3-36 | GND
DUS, 1-6 | 6-2 | COLOR FRAMING PULSE IN
TC-30, 10 | 3-10 | L; TC EXIST IN
SY-18, 42-7 | 35-2 | L; TC EXIST OUT
TC-30, 30 | 3-30 | H; POWER RESET/REC RUN
SY-18, 42-1 | 32-1 | TT DATA 0 IN
SY-18, 42-4 | 32-4 | TT DATA 1 IN
SY-18, 42-3 | 32-3 | TT DATA 2 IN
SY-18, 44-2 | 32-2 | TT DATA 3 IN
TC-30, 11 | 3-11 | TC DATA 0 IN
TC-30, 12 | 3-12 | TC DATA 1 IN
TC-30, 13 | 3-13 | TC DATA 2 IN
TC-30, 14 | 3-14 | TC DATA 3 IN
TC-30, 19 | 3-19 | TC DIGIT 0 IN
TC-30, 20 | 3-20 | TC DIGIT 1 IN
TC-30, 21 | 3-21 | TC DIGIT 2 IN
TC-30, 22 | 3-22 | TC DIGIT 3 IN
TC-30, 23 | 3-23 | TC DIGIT 4 IN
TC-30, 24 | 3-24 | TC DIGIT 5 IN
TC-30, 1 | 3-1 | H; REC RUN OUT
TC-30, 2 | 3-2 | 1/2VD IN (G)
TC-30, 3 | 3-3 | 1/2VD IN (X)
TC-30, 5 | 3-5 | COMPOSITE SYNC OUT (X)
TC-30, 6 | 3-6 | COMPOSITE SYNC OUT (G)
TC-30, 7 | 3-7 | H; VITC MUTE IN
TC-30, 8 | 3-8 | H; EE OUT
TC-30, 15 | 3-15 | LTC IN (G)
TC-30, 16 | 3-16 | LTC IN (X)
TC-30, 28 | 3-28 | LONGITUDINAL TC (G)
TC-30, 29 | 3-29 | LONGITUDINAL TC OUT (X)
SY-18, 42-11 | 35-6 | LONGITUDINAL TC IN (X)
SY-18, 42-10 | 35-5 | LTC OUT
SY-18, 42-12 | 35-7 | H; EE IN
SY-18, 41-11 | 31-11 | COMPOSITE SYNC IN
SY-18, 42-6 | 35-1 | 1/2 VD OUT
SY-18, 41-12 | 31-12 | H; REC RUN IN
TC-30; TIME CODE GENERATOR, BKU-150/150P
SY-18, 43-7 | 33-7 | ADDRRES 0 IN
SY-18, 43-6 | 33-6 | ADDRRES 1 IN
SY-18, 43-8 | 33-8 | ADDRRES 2 IN
SY-18, 43-11 | 33-11 | L; ADRS SET STB IN
SY-18, 43-12 | 33-12 | RAM DATA IN
SY-18, 44-1 | 34-1 | 4.19MHz/8 OUT
SY-18, 43-9 | 33-9 | H; TC WR EN IN
SY-18, 43-10 | 33-10 | DISPLAY DATA CTL/TC IN
NC | 32-5 | ——
SY-18, 43-5 | 33-5 | L; RESET IN
UNREG +12V
UNSW +5V
EVER +5V
D16 1SS123
TP1
TP2
E1
IC7 NJM4558M
Q16 2SC1623
Q17 DA114EK
Q18 2SA812
Q19 DTC144EK
HUMID D4 BR5505S
X1 4.19MHz
1 MICRO COMPUTER LCD DRIVER
A0 PORT
A1 PORT
A2 PORT
A3 PORT
B0 PORT
B1 PORT
B2 PORT
B3 PORT
PH
K0
K1
K2
K3
OSC OUT
OSC IN
RESET
SYNC OUT
COMMON
VDD
GND
M4
display every 2nd vert. active
write RAM
display
TC digit memory
L= TC WR cycle
OFF

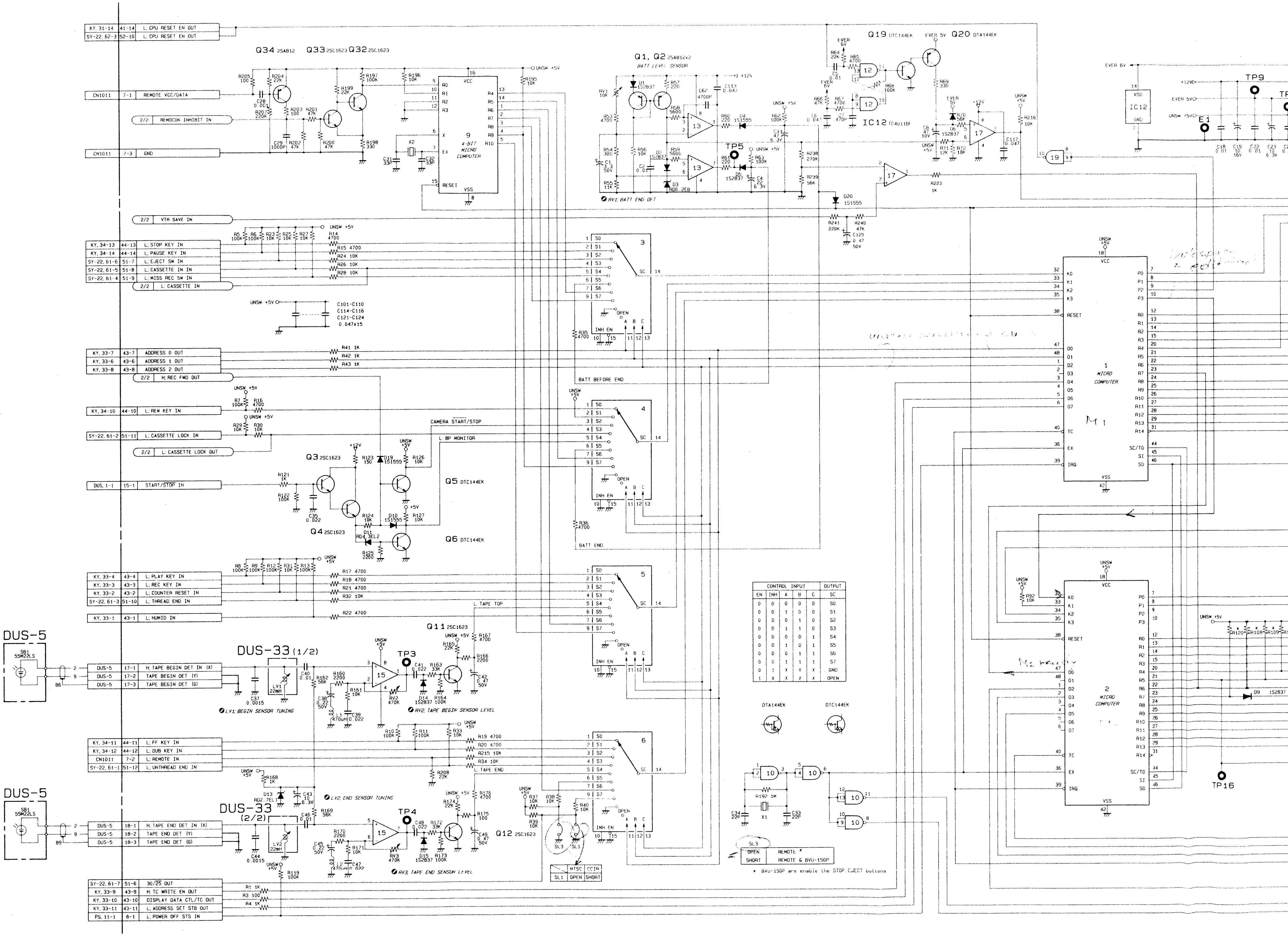
REF NO	TYPE	UNREG 12V PIN	EVER 5V PIN	GND PIN
IC1	MSM58421-74GSK		23	33
IC2	TC4056BF		16	8
IC3	TC4071BF		14	7
IC4	TC5012BF		16	8
IC5	TC4011BF		14	7
IC7	NJM4558M	8		4
IC8	TC4051BF		16	8
IC9	TC5012BF		16	8
IC10	TC5517AF		24	12
IC11	TC5012BF		16	8
IC12	TC40H027F		14	7
IC13	TC40H000F		14	7
IC14	TC40H000F		14	7
IC15	TC4538BF		16	8
IC16	TC4001BF		14	7
IC17	TC4069uBF		14	7

REF NO	TYPE	UNREG 12V PIN	EVER 5V PIN	GND PIN
IC1	MSM58421-74GSK		23	33
IC2	TC4056BF		16	8
IC3	TC4071BF		14	7
IC4	TC5012BF		16	8
IC5	TC4011BF		14	7
IC7	NJM4558M	8		4
IC8	TC4051BF		16	8
IC9	TC5012BF		16	8
IC10	TC5517AF		24	12
IC11	TC5012BF		16	8
IC12	TC40H027F		14	7
IC13	TC40H000F		14	7
IC14	TC40H000F		14	7
IC15	TC4538BF		16	8
IC16	TC4001BF		14	7
IC17	TC4069uBF		14	7


humid detector
IC7 NJM4558M
Q16 2SC1623
Q17 DTA114EK
Q19 DTC144EK
HUMID D4 BR5505S
Q6 DTC114YK SLACK
Q7 DTC114YK SERVO
Q8 DTC114YK TAPE END
Q9 DTC114YK BATT
Q10 DTC114YK PLAY
Q11 DTC114YK FF
Q12 DTC114YK REW
Q13 DTC114YK REC
Q14 DTC114YK DUB
Q15 DTC114YK PAUSE
Q1 2SD789-3
Q2 DTC144EK
UNREG +12V
HUMID DET IN 34-6 SY-18, 44-6
L; HUMID OUT 33-1 SY-18, 43-1
L; CPU RESET EN IN 31-14 SY-18, 41-14
H; PAUSE LAMP IN 31-8 SY-18, 41-8
H; DUB LAMP IN 31-7 SY-18, 41-7
H; REC LAMP IN 31-6 SY-18, 41-6
H; REW LAMP IN 31-4 SY-18, 41-4
H; FF LAMP IN 31-1 SY-18, 41-1
H; PLAY LAMP IN 31-5 SY-18, 41-5
H; BATT END LAMP IN 31-2 SY-18, 41-2
H; TAPE END LAMP IN 35-3 SY-18, 42-8
H; SERVO LAMP IN 35-4 SY-18, 42-9
H; SLACK LAMP IN 31-3 SY-18, 41-3
CH-1 AUDIO LEVEL VR IN (X) 5-1 AU-64, 45-1
CH-1 AUDIO LEVEL VR OUT (Y) 5-2 AU-64, 45-2
CH-1 AUDIO LEVEL VR (G) 5-3 AU-64, 45-3
CH-2 AUDIO LEVEL VR IN (X) 5-4 AU-65, 65-1
CH-2 AUDIO LEVEL VR OUT (Y) 5-5 AU-65, 65-2
CH-2 AUDIO LEVEL VR (G) 5-6 AU-65, 65-3
CH-2 AUDIO LEVEL VR (G) 8-3 RV1002
CH-2 AUDIO LEVEL VR IN (Y) 8-2 RV1002
CH-2 AUDIO LEVEL VR OUT (X) 8-1 RV1002
CH-1 AUDIO LEVEL VR (G) 7-3 RV1001
CH-1 AUDIO LEVEL VR IN (Y) 7-2 RV1001
CH-1 AUDIO LEVEL VR OUT (X) 7-1 RV1001
METER LAMP 1 (X) T PL1001
METER LAMP 1 (G) U PL1001
METER LAMP 2 (X) V PL1002
METER LAMP 2 (G) W PL1002
S3 LIGHT ON ↔ OFF
PL1 PL2 FOR LCD
EVER +5V
1 MICRO COMPUTER LCD DRIVER
M4
A0 PORT A1 PORT A2 PORT A3 PORT
B0 PORT B1 PORT B2 PORT B3 PORT
PH K0 K1 K2 K3
OSC OUT OSC IN RESET
SYNC OUT COMMON
VDD GND
Q18 2SA812
X1 4.19MHz
display: sever / 2nd vert. active
write RAM / display
TC digit memory
10
W/R EN CS
TP1 TP2 E1
UNSW +5V
V. D. ENABLE
V TC digit enable
L; STOP KEY OUT 34-13 SY-18, 44-13
L; PLAY KEY OUT 33-4 SY-18, 43-4
L; FF KEY OUT 34-11 SY-18, 44-11
L; REW KEY OUT 34-10 SY-18, 44-10
L; REC KEY OUT 33-3 SY-18, 43-3
L; DUB KEY OUT 34-12 SY-18, 44-12
L; PAUSE KEY OUT 34-14 SY-18, 44-14
S4 STOP S5 PLAY S6 FF S7 REW S8 REC S9 DUB S10 PAUSE
S11 INHIBIT OFF ↔ ON
S1 RESET
Q21 DTC144EK
INHIBIT 34-3 SY-18, 44-3
3.58MHz IN 34-2 SY-18, 44-2
GEN/PB IN 3-25 TC-30, 25
L; PB IN 31-10 SY-18, 41-10
H; TC MUTE OUT 3-26 TC-30, 26
L; GEN SW OUT 31-13 SY-18, 41-13
L; TC RESET OUT 3-17 TC-30, 17
VITC IN (X) 3-18 TC-30, 18
VITC OUT (X) 6-3 VO, 14-2
VITC OUT (G) 6-1 VO, 14-3
Q20 DTC144EK Q3 DTC144EK Q4 DTC144EK Q22 2SC1623
L; COUNTER RESET OUT 33-2 SY-18, 43-2
S2 CTL ↕ TC
CTL DISPLAY/TC OUT 3-9 TC-30, 9
CTL DISPLAY/TC OUT 31-9 SY-18, 41-9
L; BKU DET IN 3-4 TC-30, 4
L; BKU DET OUT 34-4 SY-18, 44-4

KY-86
1-615-964-13
BVU-150P
BVU-150

SY-18C (1/2) (SYSTEM CONTROL)
DUS-5 (SOLAR BATTERY)
DUS-33 (VAR, INDUCTOR)

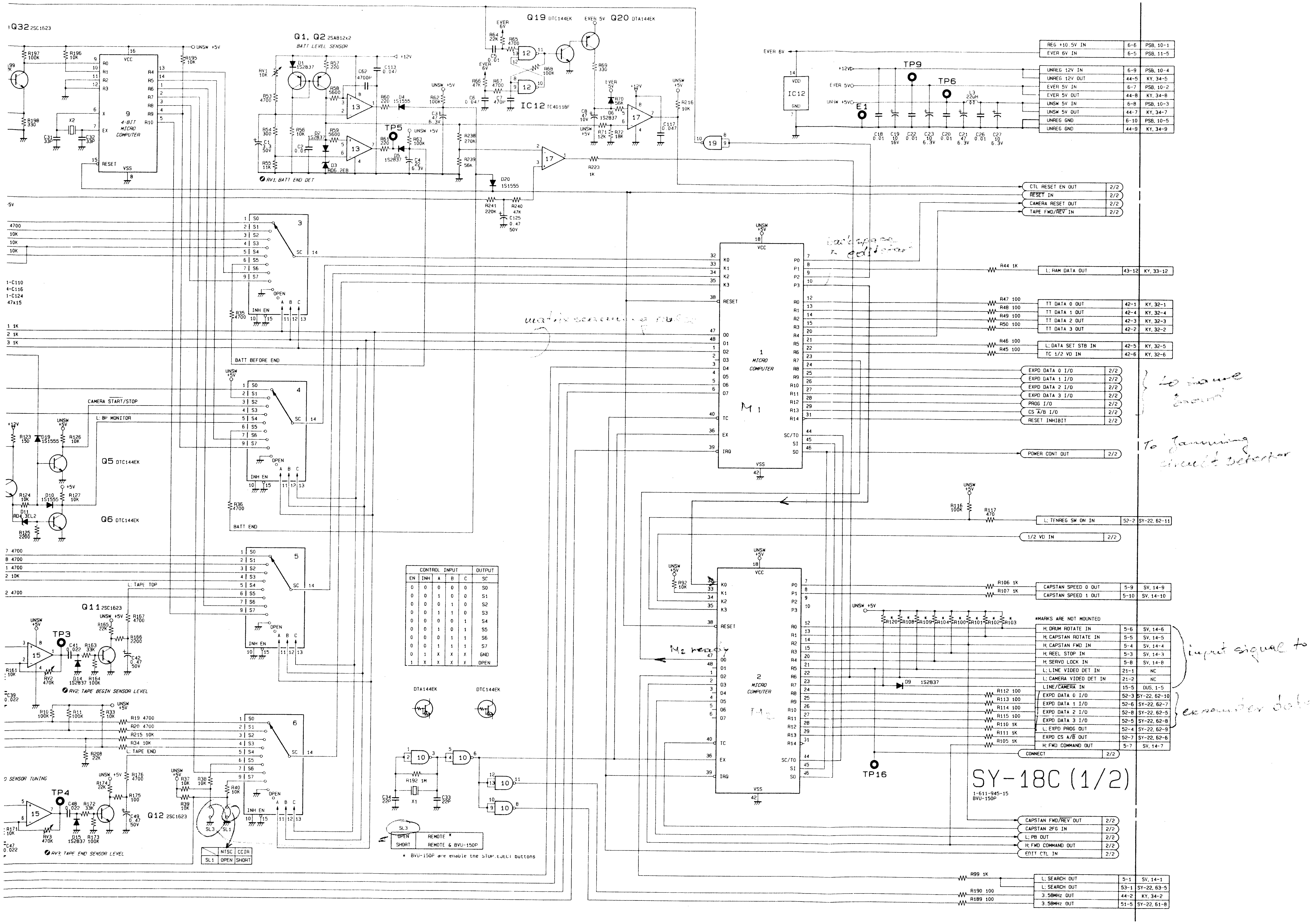


CONTROL INPUT					OUTPUT
EN	INH	A	B	C	SC
0	0	0	0	0	S0
0	0	1	0	0	S1
0	0	0	1	0	S2
0	0	1	1	0	S3
0	0	0	0	1	S4
0	0	1	0	1	S5
0	0	0	1	1	S6
0	0	1	1	1	S7
0	1	X	X	X	GND
1	X	X	X	X	OPEN

SL3	
OPEN	REMOTE *
SHORT	REMOTE & BVU-150P

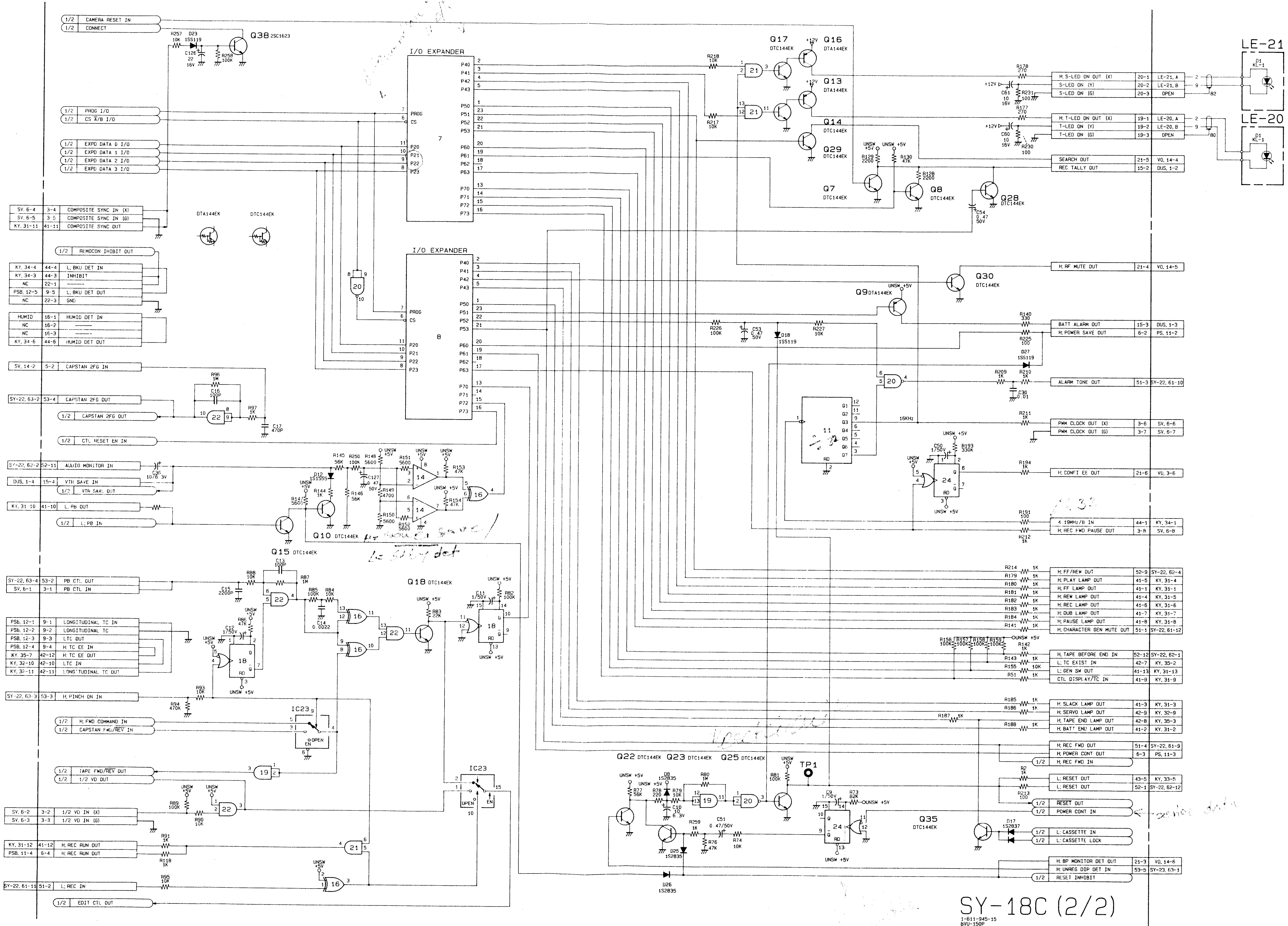
* BVU-150P are enable the STOP.EJECT buttons

	NTSC	CCIR
SL1	OPEN	SHORT

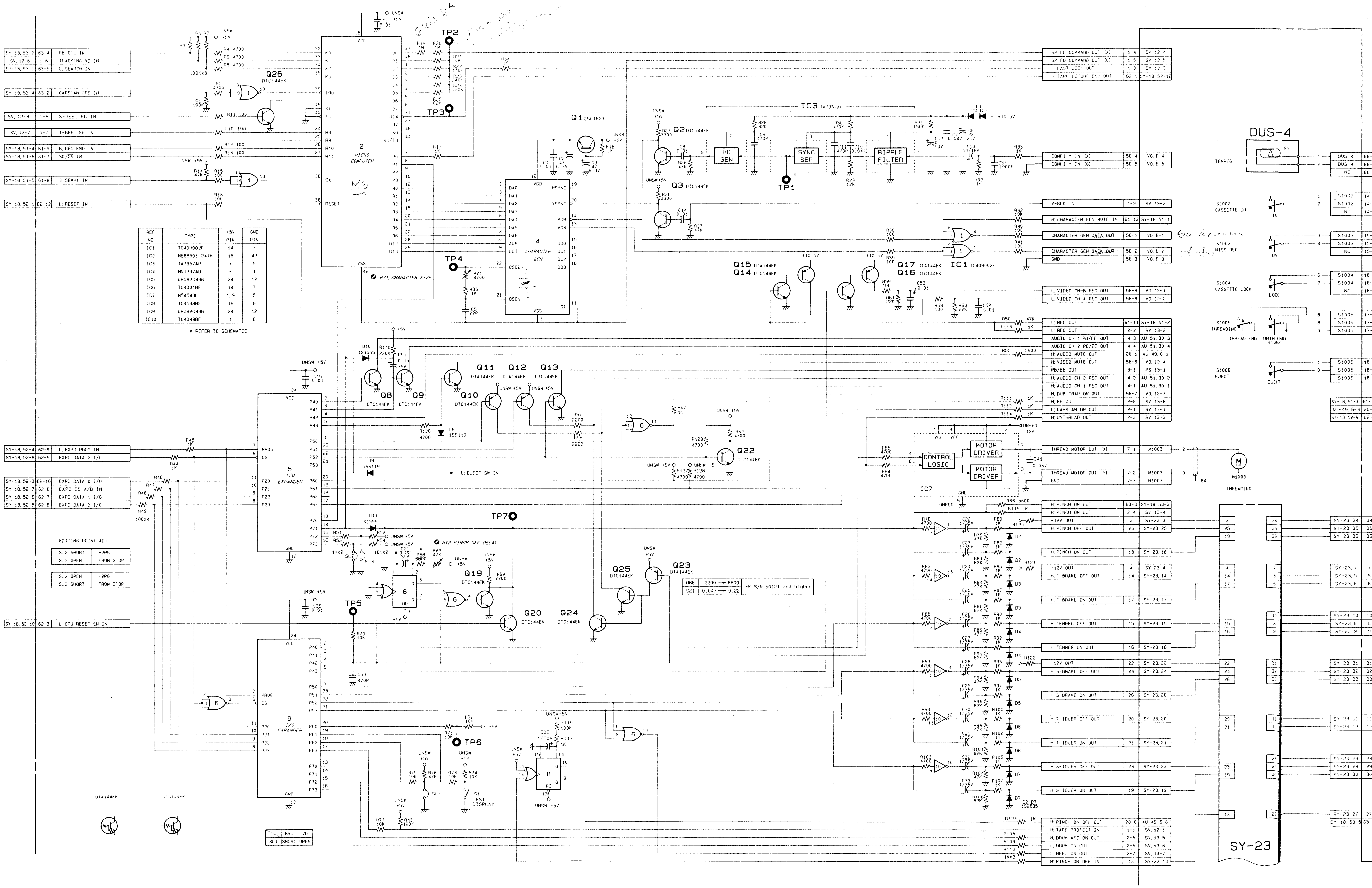

SY-18C (1/2)
1-611-945-15
BVU-150P
Q32 2SC1623
9 4-BIT MICRO COMPUTER
Q1, Q2 2SA812x2 BATT LEVEL SENSOR
RV1: BATT END DET
Q19 DTC144EK
Q20 DTA144EK
IC12 TC4011BF
TP5
TP9
TP6
TP3
TP4
TP16
E1
BATT BEFORE END
BATT END
CAMERA START/STOP
L; BP MONITOR
L; TAPE TOP
L; TAPE END
Q5 DTC144EK
Q6 DTC144EK
Q11 2SC1623
Q12 2SC1623
RV2: TAPE BEGIN SENSOR LEVEL
RV3: TAPE END SENSOR LEVEL
1 MICRO COMPUTER
2 MICRO COMPUTER
DTA144EK
DTC144EK
X1
SL1
SL3
NTSC CCIR
SL1 OPEN SHORT
SL3 OPEN REMOTE *
SHORT REMOTE & BVU-150P
* BVU-150P are enable the STOP/EJECT buttons
*MARKS ARE NOT MOUNTED
REG +10.5V IN 6-6 PSB, 10-1
EVER 6V IN 6-5 PSB, 11-5
UNREG 12V IN 6-9 PSB, 10-4
UNREG 12V OUT 44-5 KY, 34-5
EVER 5V IN 6-7 PSB, 10-2
EVER 5V OUT 44-8 KY, 34-8
UNSW 5V IN 6-8 PSB, 10-3
UNSW 5V OUT 44-7 KY, 34-7
UNREG GND 6-10 PSB, 10-5
UNREG GND 44-9 KY, 34-9
CTL RESET EN OUT 2/2
RESET IN 2/2
CAMERA RESET OUT 2/2
TAPE FWD/REV IN 2/2
L; RAM DATA OUT 43-12 KY, 33-12
TT DATA 0 OUT 42-1 KY, 32-1
TT DATA 1 OUT 42-4 KY, 32-4
TT DATA 2 OUT 42-3 KY, 32-3
TT DATA 3 OUT 42-2 KY, 32-2
L; DATA SET STB IN 42-5 KY, 32-5
TC 1/2 VD IN 42-6 KY, 32-6
EXPD DATA 0 I/O 2/2
EXPD DATA 1 I/O 2/2
EXPD DATA 2 I/O 2/2
EXPD DATA 3 I/O 2/2
PROG I/O 2/2
CS A/B I/O 2/2
RESET INHIBIT 2/2
POWER CONT OUT 2/2
L; TENREG SW ON IN 52-2 SY-22, 62-11
1/2 VD IN 2/2
CAPSTAN SPEED 0 OUT 5-9 SV, 14-9
CAPSTAN SPEED 1 OUT 5-10 SV, 14-10
H; DRUM ROTATE IN 5-6 SV, 14-6
H; CAPSTAN ROTATE IN 5-5 SV, 14-5
H; CAPSTAN FWD IN 5-4 SV, 14-4
H; REEL STOP IN 5-3 SV, 14-3
H; SERVO LOCK IN 5-8 SV, 14-8
L; LINE VIDEO DET IN 21-1 NC
L; CAMERA VIDEO DET IN 21-2 NC
LINE/CAMERA IN 15-5 DUS, 1-5
EXPD DATA 0 I/O 52-3 SY-22, 62-10
EXPD DATA 1 I/O 52-6 SY-22, 62-7
EXPD DATA 2 I/O 52-8 SY-22, 62-5
EXPD DATA 3 I/O 52-5 SY-22, 62-8
L; EXPD PROG OUT 52-4 SY-22, 62-9
EXPD CS A/B OUT 52-7 SY-22, 62-6
H; FWD COMMAND OUT 5-7 SV, 14-7
CONNECT 2/2
CAPSTAN FWD/REV OUT 2/2
CAPSTAN 2FG IN 2/2
L; PB OUT 2/2
H; FWD COMMAND OUT 2/2
EDIT CTL IN 2/2
L; SEARCH OUT 5-1 SV, 14-1
L; SEARCH OUT 53-1 SY-22, 63-5
3.58MHz OUT 44-2 KY, 34-2
3.58MHz OUT 51-5 SY-22, 61-8
M1
M2
M2 ready
matrix scanning pulse
to same board
To Jamming circuit detector
input signal to M2 in parallel
expander data SY22

CONTROL INPUT					OUTPUT
EN	INH	A	B	C	SC
0	0	0	0	0	S0
0	0	1	0	0	S1
0	0	0	1	0	S2
0	0	1	1	0	S3
0	0	0	0	1	S4
0	0	1	0	1	S5
0	0	0	1	1	S6
0	0	1	1	1	S7
0	1	X	X	X	GND
1	X	X	X	X	OPEN

SY-18C (2/2) (SYSTEM CONTROL)
LE-20 (LED FOR TAPE BEGIN/END DET)
LE-21 (LED FOR TAPE BEGIN/END DET)


1/2 CAMERA RESET IN
1/2 CONNECT
Q38 2SC1623
I/O EXPANDER
1/2 PROG I/O
1/2 CS A/B I/O
1/2 EXPD DATA 0 I/O
1/2 EXPD DATA 1 I/O
1/2 EXPD DATA 2 I/O
1/2 EXPD DATA 3 I/O
SV, 6-4 3-4 COMPOSITE SYNC IN (X)
SV, 6-5 3-5 COMPOSITE SYNC IN (G)
KY, 31-11 41-11 COMPOSITE SYNC OUT
DTA144EK
DTC144EK
1/2 REMOCON IHIBIT OUT
KY, 34-4 44-4 L; BKU DET IN
KY, 34-3 44-3 INHIBIT
NC 22-1
PSB, 12-5 9-5 L; BKU DET OUT
NC 22-3 GND
HUMID 16-1 HUMID DET IN
NC 16-2
NC 16-3
KY, 34-6 44-6 HUMID DET OUT
SV, 14-2 5-2 CAPSTAN 2FG IN
SY-22, 63-2 53-4 CAPSTAN 2FG OUT
1/2 CAPSTAN 2FG OUT
1/2 CTL RESET EN IN
SY-22, 62-2 52-11 AUDIO MONITOR IN
DUS, 1-4 15-4 VTR SAVE IN
1/2 VTR SAVE OUT
KY, 31-10 41-10 L; PB OUT
1/2 L; PB IN
Q10 DTC144EK
Q15 DTC144EK
Q18 DTC144EK
SY-22, 63-4 53-2 PB CTL OUT
SV, 6-1 3-1 PB CTL IN
PSB, 12-1 9-1 LONGITUDINAL TC IN
PSB, 12-2 9-2 LONGITUDINAL TC
PSB, 12-3 9-3 LTC OUT
PSB, 12-4 9-4 H; TC EE IN
KY, 35-7 42-12 H; TC EE OUT
KY, 32-10 42-10 LTC IN
KY, 32-11 42-11 LONGITUDINAL TC OUT
SY-22, 63-3 53-3 H; PINCH ON IN
IC23
1/2 H; FWD COMMAND IN
1/2 CAPSTAN FWD/REV IN
1/2 TAPE FWD/REV OUT
1/2 1/2 VD OUT
SV, 6-2 3-2 1/2 VD IN (X)
SV, 6-3 3-3 1/2 VD IN (G)
KY, 31-12 41-12 H; REC RUN OUT
PSB, 11-4 6-4 H; REC RUN OUT
SY-22, 61-11 51-2 L; REC IN
1/2 EDIT CTL OUT
Q17 DTC144EK
Q16 DTA144EK
Q13 DTA144EK
Q14 DTC144EK
Q29 DTC144EK
Q7 DTC144EK
Q8 DTC144EK
Q28 DTC144EK
Q30 DTC144EK
Q9 DTA144EK
H; S-LED ON OUT (X) 20-1 LE-21, A
S-LED ON (Y) 20-2 LE-21, B
S-LED ON (G) 20-3 OPEN
H; T-LED ON OUT (X) 19-1 LE-20, A
T-LED ON (Y) 19-2 LE-20, B
T-LED ON (G) 19-3 OPEN
SEARCH OUT 21-5 VO, 14-4
REC TALLY OUT 15-2 DUS, 1-2
LE-21
LE-20
D1 KL-1
H; RF MUTE OUT 21-4 VO, 14-5
BATT ALARM OUT 15-3 DUS, 1-3
H; POWER SAVE OUT 6-2 PS, 11-2
ALARM TONE OUT 51-3 SY-22, 61-10
PWM CLOCK OUT (X) 3-6 SV, 6-6
PWM CLOCK OUT (G) 3-7 SV, 6-7
H; CONFI EE OUT 21-6 VO, 3-6
4.19MHz/8 IN 44-1 KY, 34-1
H; REC FWD PAUSE OUT 3-8 SV, 6-8
H; FF/REW OUT 52-9 SY-22, 62-4
H; PLAY LAMP OUT 41-5 KY, 31-4
H; FF LAMP OUT 41-1 KY, 31-1
H; REW LAMP OUT 41-4 KY, 31-5
H; REC LAMP OUT 41-6 KY, 31-6
H; DUB LAMP OUT 41-7 KY, 31-7
H; PAUSE LAMP OUT 41-8 KY, 31-8
H; CHARACTER GEN MUTE OUT 51-1 SY-22, 61-12
H; TAPE BEFORE END IN 52-12 SY-22, 62-1
L; TC EXIST IN 42-7 KY, 35-2
L; GEN SW OUT 41-13 KY, 31-13
CTL DISPLAY/TC IN 41-9 KY, 31-9
H; SLACK LAMP OUT 41-3 KY, 31-3
H; SERVO LAMP OUT 42-9 KY, 32-9
H; TAPE END LAMP OUT 42-8 KY, 35-3
H; BATT END LAMP OUT 41-2 KY, 31-2
H; REC FWD OUT 51-4 SY-22, 61-9
H; POWER CONT OUT 6-3 PS, 11-3
1/2 H; REC FWD IN
L; RESET OUT 43-5 KY, 33-5
L; RESET OUT 52-1 SY-22, 62-12
1/2 RESET OUT
1/2 POWER CONT IN
1/2 L; CASSETTE IN
1/2 L; CASSETTE LOCK
H; BP MONITOR DET OUT 21-3 VO, 14-6
H; UNREG DIP DET IN 53-5 SY-23, 63-1
1/2 RESET INHIBIT
Q22 DTC144EK
Q23 DTC144EK
Q25 DTC144EK
Q35 DTC144EK
TP1
SY-18C (2/2)
1-611-945-15
BVU-150P

SY-22A (SYSTEM CONTROL)
DUS-4 (TENREG SW)


SY-18, 53-2 | 63-4 | PB CTL IN
SV, 12-6 | 1-6 | TRACKING VD IN
SY-18, 53-1 | 63-5 | L: SEARCH IN
SY-18, 53-4 | 63-2 | CAPSTAN 2FG IN
SV, 12-8 | 1-8 | S-REEL FG IN
SV, 12-7 | 1-7 | T-REEL FG IN
SY-18, 51-4 | 61-9 | H: REC FWD IN
SY-18, 51-6 | 61-7 | 30/25 IN
SY-18, 51-5 | 61-8 | 3.58MHz IN
SY-18, 52-1 | 62-12 | L: RESET IN
SY-18, 52-4 | 62-9 | L: EXPD PROG IN
SY-18, 52-8 | 62-5 | EXPD DATA 2 I/O
SY-18, 52-3 | 62-10 | EXPD DATA 0 I/O
SY-18, 52-7 | 62-6 | EXPD CS A/B IN
SY-18, 52-6 | 62-7 | EXPD DATA 1 I/O
SY-18, 52-5 | 62-8 | EXPD DATA 3 I/O
SY-18, 52-10 | 62-3 | L: CPU RESET EN IN
2 MICRO COMPUTER
4 CHARACTER GEN
5 I/O EXPANDER
9 I/O EXPANDER
IC3 TA7357AP
HD GEN
SYNC SEP
RIPPLE FILTER
IC1 TC40H002F
IC7
CONTROL LOGIC
MOTOR DRIVER
MOTOR DRIVER
Q1 2SC1623
Q2 DTC144EK
Q3 DTC144EK
Q8 DTC144EK
Q9 DTC144EK
Q10 DTC144EK
Q11 DTA144EK
Q12 DTA144EK
Q13 DTC144EK
Q14 DTC144EK
Q15 DTA144EK
Q16 DTC144EK
Q17 DTA144EK
Q19 DTC144EK
Q20 DTC144EK
Q22 DTC144EK
Q23 DTA144EK
Q24 DTC144EK
Q25 DTC144EK
Q26 DTC144EK
TP1
TP2
TP3
TP4
TP5
TP6
TP7
RV1 CHARACTER SIZE
RV2 PINCH OFF DELAY
L: EJECT SW IN
S1 TEST DISPLAY
D10 1SS555
D8 1SS119
D9 1SS119
D11 1SS555
D2-D7 1S2835
SPEED COMMAND OUT (X) | 1-4 | SV, 12-4
SPEED COMMAND OUT (G) | 1-5 | SV, 12-5
L: FAST LOCK OUT | 1-3 | SV, 12-3
H: TAPE BEFORE END OUT | 62-1 | SY-18, 52-12
CONFI Y IN (X) | 56-4 | VO, 6-4
CONFI Y IN (G) | 56-5 | VO, 6-5
V-BLK IN | 1-2 | SV, 12-2
H: CHARACTER GEN MUTE IN | 61-12 | SY-18, 51-1
CHARACTER GEN DATA OUT | 56-1 | VO, 6-1
CHARACTER GEN BACK OUT | 56-2 | VO, 6-2
GND | 56-3 | VO, 6-3
L: VIDEO CH-B REC OUT | 56-9 | VO, 12-1
L: VIDEO CH-A REC OUT | 56-8 | VO, 12-2
L: REC OUT | 61-11 | SY-18, 51-2
L: REC OUT | 2-2 | SV, 13-2
AUDIO CH-1 PB/EE OUT | 4-3 | AU-51, 30-3
AUDIO CH-2 PB/EE OUT | 4-4 | AU-51, 30-4
H: AUDIO MUTE OUT | 20-1 | AU-49, 6-1
H: VIDEO MUTE OUT | 56-6 | VO, 12-4
PB/EE OUT | 3-1 | PS, 13-1
H: AUDIO CH-2 REC OUT | 4-2 | AU-51, 30-2
H: AUDIO CH-1 REC OUT | 4-1 | AU-51, 30-1
H: DUB TRAP ON OUT | 56-7 | VO, 12-3
H: EE OUT | 2-8 | SV, 13-8
L: CAPSTAN ON OUT | 2-1 | SV, 13-1
H: UNTHREAD OUT | 2-3 | SV, 13-3
THREAD MOTOR OUT (X) | 7-1 | M1003
THREAD MOTOR OUT (Y) | 7-2 | M1003
GND | 7-3 | M1003
M1003 THREADING
H: PINCH ON OUT | 63-3 | SY-18, 53-3
H: PINCH ON OUT | 2-4 | SV, 13-4
+12V OUT | 3 | SY-23, 3
H: PINCH OFF OUT | 25 | SY-23, 25
H: PINCH ON OUT | 18 | SY-23, 18
+12V OUT | 4 | SY-23, 4
H: T-BRAKE OFF OUT | 14 | SY-23, 14
H: T-BRAKE ON OUT | 17 | SY-23, 17
H: TENREG OFF OUT | 15 | SY-23, 15
H: TENREG ON OUT | 16 | SY-23, 16
+12V OUT | 22 | SY-23, 22
H: S-BRAKE OFF OUT | 24 | SY-23, 24
H: S-BRAKE ON OUT | 26 | SY-23, 26
H: T-IDLER OFF OUT | 20 | SY-23, 20
H: T-IDLER ON OUT | 21 | SY-23, 21
H: S-IDLER OFF OUT | 23 | SY-23, 23
H: S-IDLER ON OUT | 19 | SY-23, 19
H: PINCH ON OFF OUT | 20-6 | AU-49, 6-6
H: TAPE PROTECT IN | 1-1 | SV, 12-1
H: DRUM AFC ON OUT | 2-5 | SV, 13-5
L: DRUM ON OUT | 2-6 | SV, 13-6
L: REEL ON OUT | 2-7 | SV, 13-7
H: PINCH ON OFF IN | 13 | SY-23, 13
SY-23
DUS-4
TENREG
S1
S1002 CASSETTE IN
S1003 MISS REC
S1004 CASSETTE LOCK
S1005 THREADING
THREAD END
UNTH END S1007
S1006 EJECT
SY-18, 51-3
AU-49, 6-4
SY-18, 52-9
DTA144EK
DTC144EK

REF NO	TYPE	+5V PIN	GND PIN
IC1	TC40H002F	14	7
IC2	MB88501-247M	18	42
IC3	TA7357AP	*	5
IC4	MN1237AD	*	1
IC5	uPD82C43G	24	12
IC6	TC4001BF	14	7
IC7	M54543L	1, 9	5
IC8	TC4538BF	16	8
IC9	uPD82C43G	24	12
IC10	TC4049BF	1	8

* REFER TO SCHEMATIC

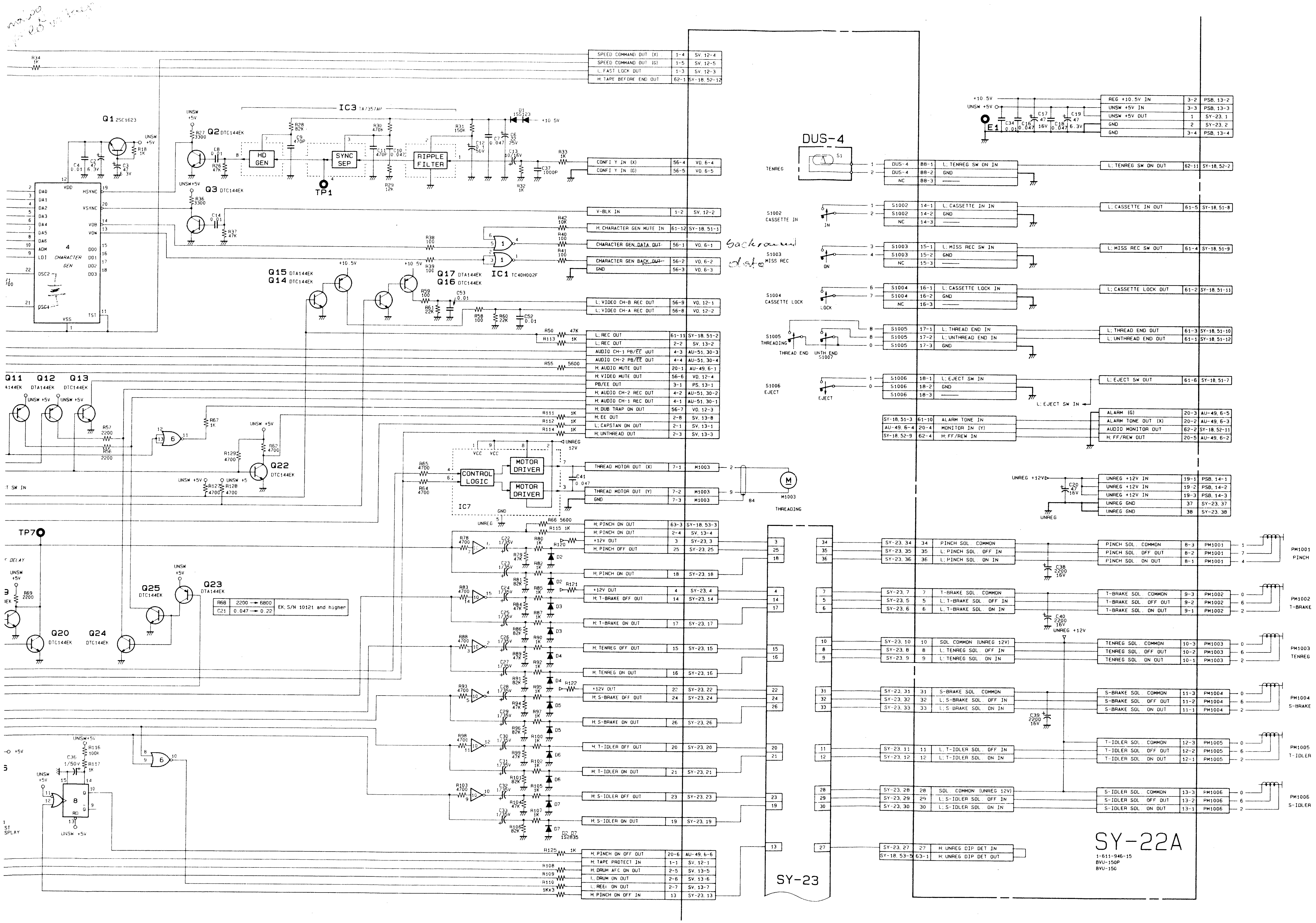
EDITING POINT ADJ

SL2 SHORT SL3 OPEN	-2PG FROM STOP

SL2 OPEN SL3 SHORT	+2PG FROM STOP

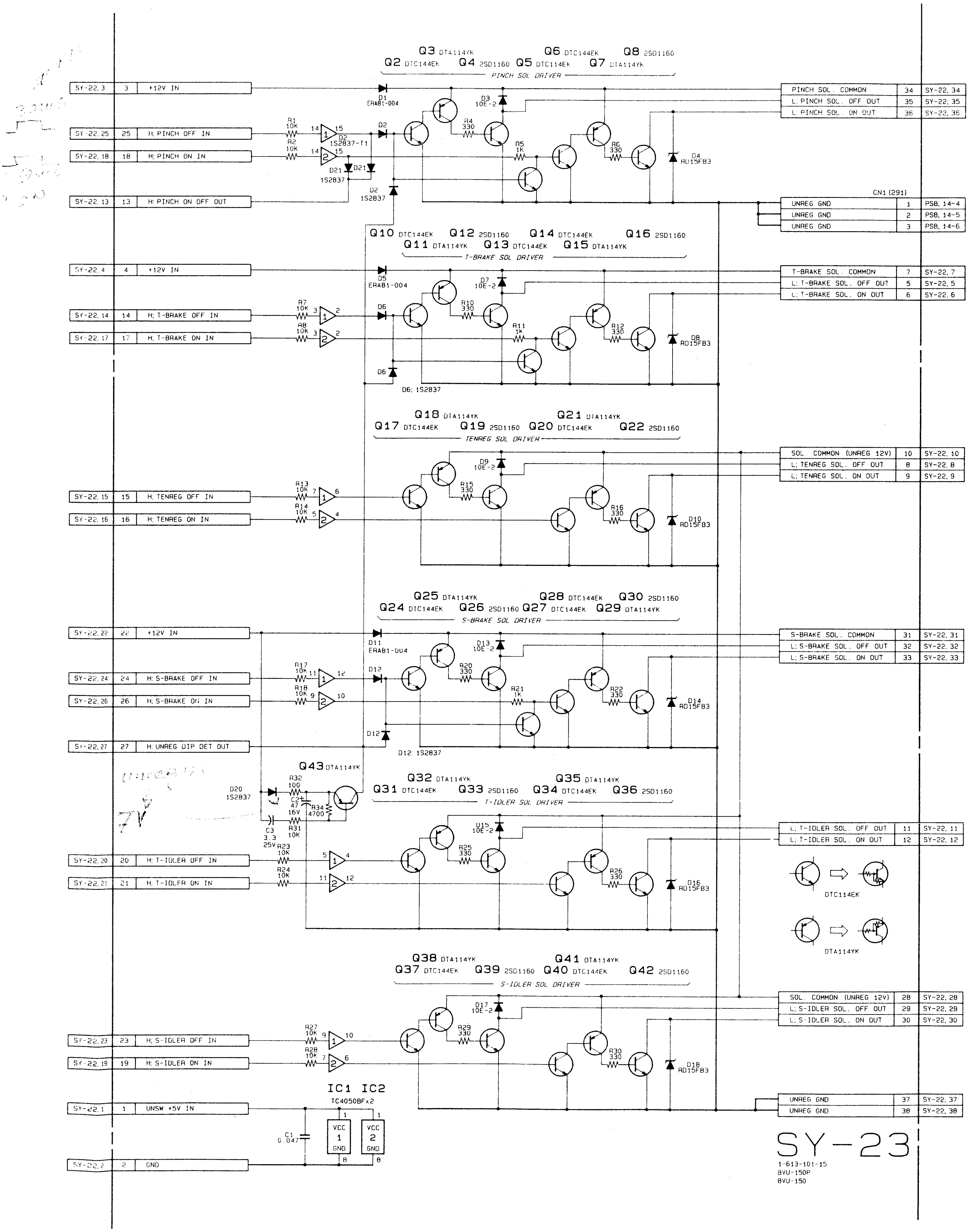
R68	2200 → 6800	EK: S/N 10121 and higher
C21	0.047 → 0.22	

	BVU	VO
SL1	SHORT	OPEN

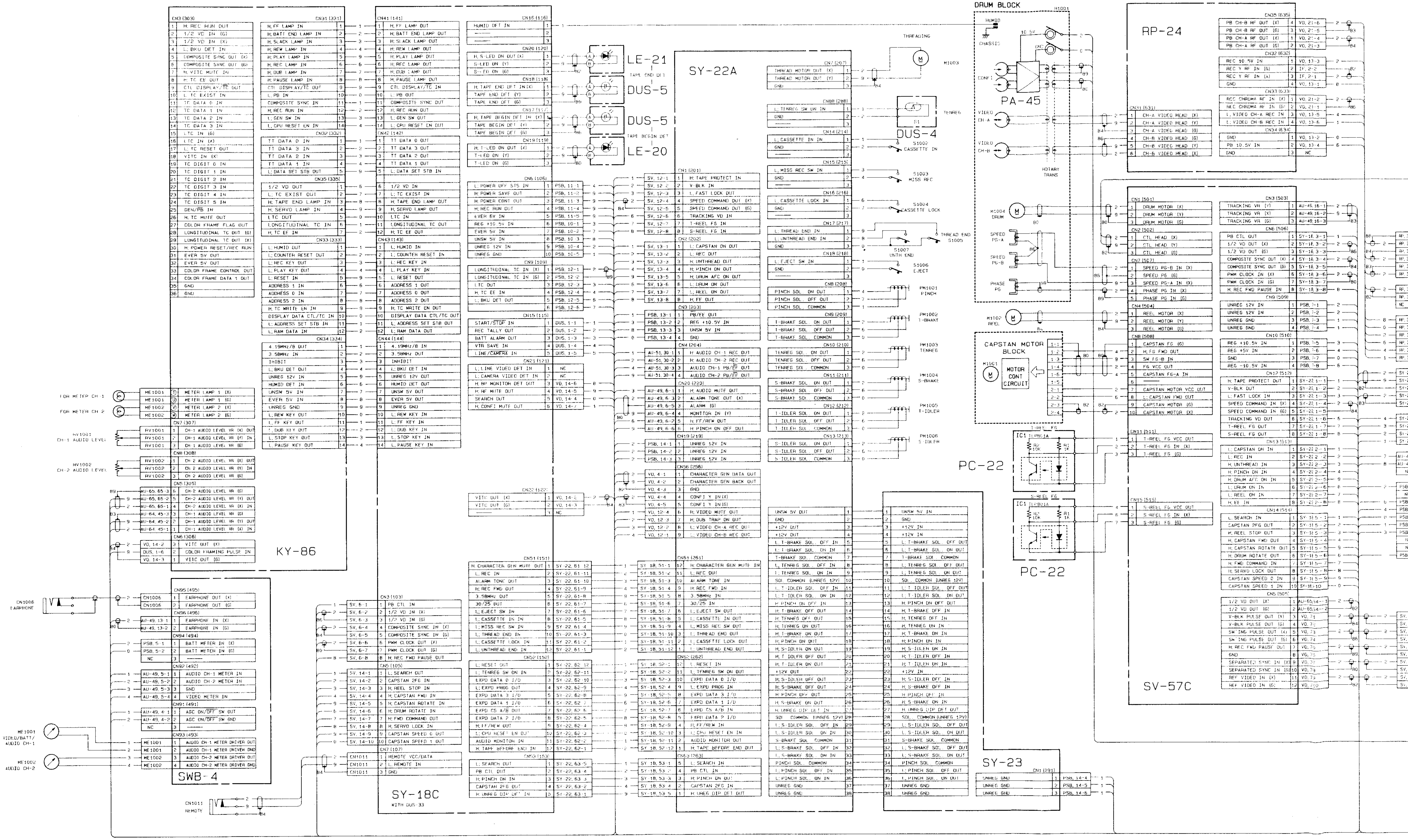


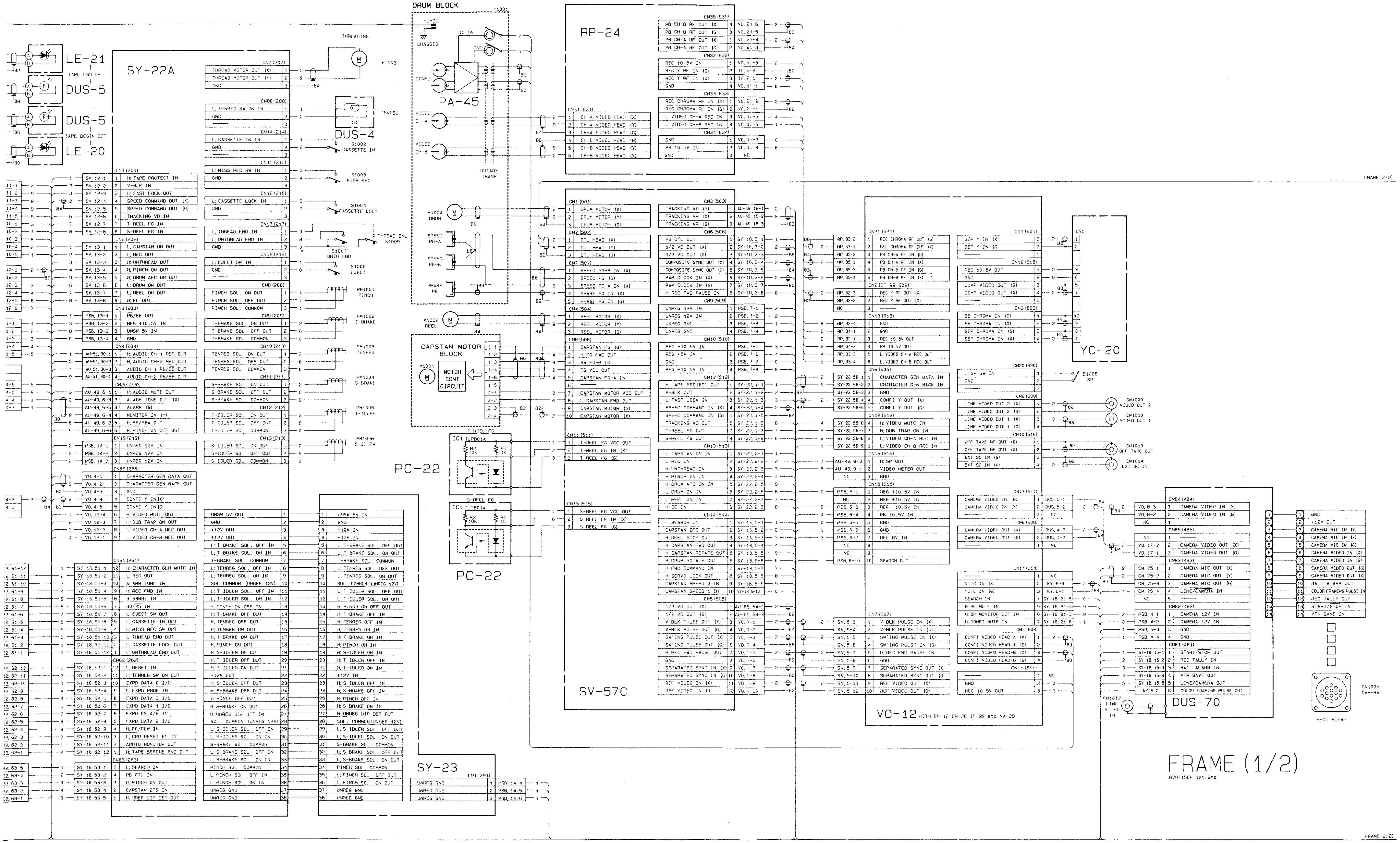
Q1 2SC1623
Q2 DTC144EK
Q3 DTC144EK
IC3 TA7357AP
HD GEN
SYNC SEP
RIPPLE FILTER
TP1
4 CHARACTER GEN
Q15 DTA144EK
Q14 DTC144EK
Q17 DTA144EK
Q16 DTC144EK
IC1 TC4D002F
Q11 Q12 Q13
Q22 DTC144EK
Q25 DTC144EK
Q23 DTA144EK
Q20 DTC144EK
Q24 DTC144EK
TP7
CONTROL LOGIC
MOTOR DRIVER
MOTOR DRIVER
IC7
M1003 THREADING
R68 2200 → 6800
C21 0.047 → 0.22
EK:S/N 10121 and higher
Background data
DUS-4
TENREG
S1002 CASSETTE IN
S1003 MISS REC
S1004 CASSETTE LOCK
S1005 THREADING
S1006 EJECT
E1
SPEED COMMAND OUT (X)
SPEED COMMAND OUT (G)
L:FAST LOCK OUT
H:TAPE BEFORE END OUT
CONFI Y IN (X)
CONFI Y IN (G)
V-BLK IN
H:CHARACTER GEN MUTE IN
CHARACTER GEN DATA OUT
CHARACTER GEN BACK OUT
L:VIDEO CH-B REC OUT
L:VIDEO CH-A REC OUT
L:REC OUT
THREAD MOTOR OUT (X)
THREAD MOTOR OUT (Y)
H:PINCH ON OUT
H:T-BRAKE OFF OUT
H:TENREG OFF OUT
H:S-BRAKE OFF OUT
H:T-IDLER OFF OUT
H:S-IDLER OFF OUT
SY-23
PINCH SOL COMMON
T-BRAKE SOL COMMON
TENREG SOL COMMON
S-BRAKE SOL COMMON
T-IDLER SOL COMMON
S-IDLER SOL COMMON
PM1001 PINCH
PM1002 T-BRAKE
PM1003 TENREG
PM1004 S-BRAKE
PM1005 T-IDLER
PM1006 S-IDLER
SY-22A
1-611-946-15
BVU-150P
BVU-150

SY-23 (SOLENOID DRIVER)

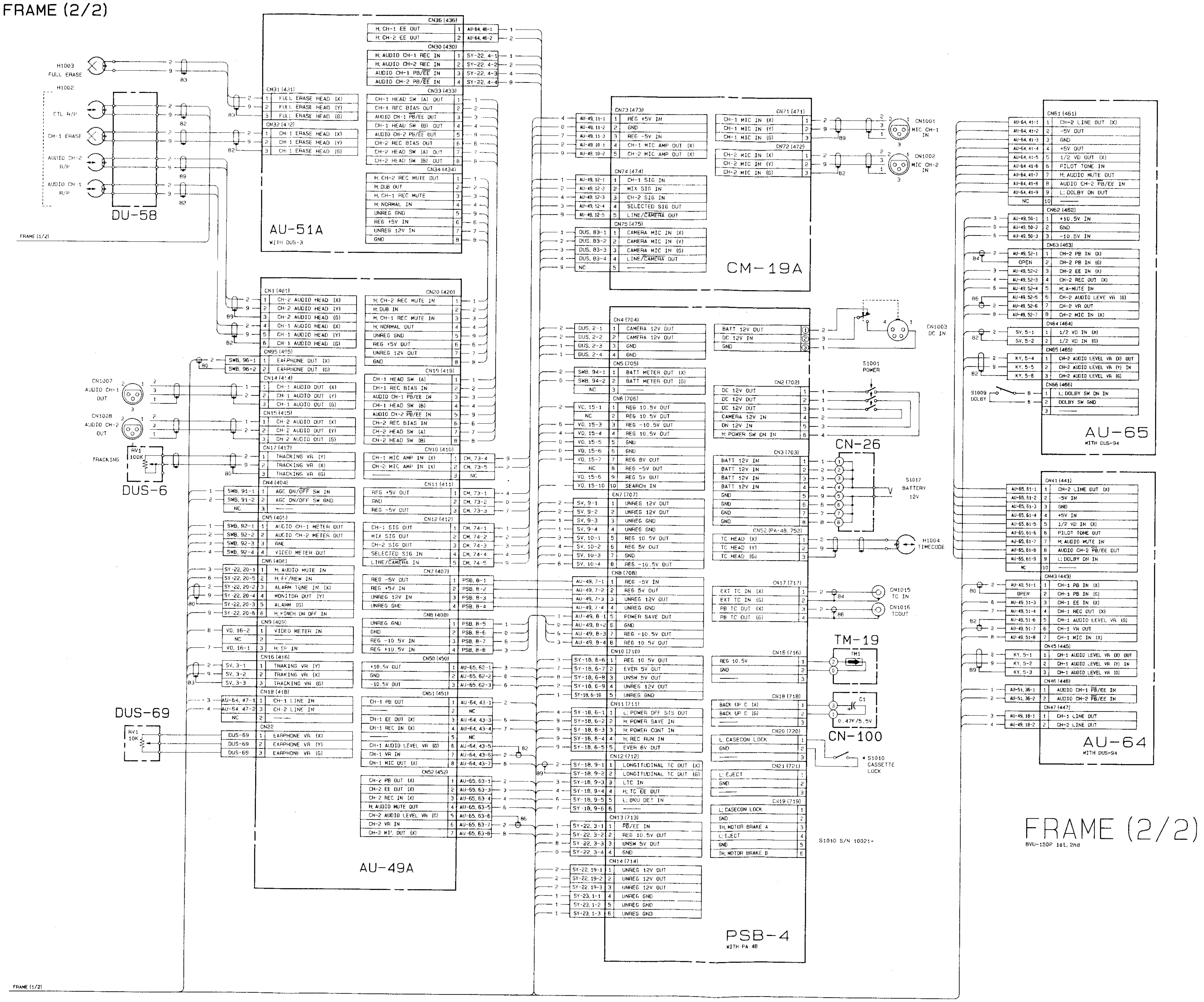

Q3 DTA114YK
Q6 DTC144EK
Q8 2SD1160
Q2 DTC144EK
Q4 2SD1160
Q5 DTC114EK
Q7 DTA114YK
PINCH SOL DRIVER
SY-22, 3 | 3 | +12V IN
SY-22, 25 | 25 | H: PINCH OFF IN
SY-22, 18 | 18 | H: PINCH ON IN
SY-22, 13 | 13 | H: PINCH ON OFF OUT
D1 ERA81-004
D2 1S2837-T1
D21 1S2837
D3 10E-2
D4 RD15FB3
R1 10K
R2 10K
R4 330
R5 1K
R6 330
PINCH SOL. COMMON | 34 | SY-22, 34
L: PINCH SOL. OFF OUT | 35 | SY-22, 35
L: PINCH SOL. ON OUT | 36 | SY-22, 36
CN1 (291)
UNREG GND | 1 | PSB, 14-4
UNREG GND | 2 | PSB, 14-5
UNREG GND | 3 | PSB, 14-6
Q10 DTC144EK
Q12 2SD1160
Q14 DTC144EK
Q16 2SD1160
Q11 DTA114YK
Q13 DTC144EK
Q15 DTA114YK
T-BRAKE SOL DRIVER
SY-22, 4 | 4 | +12V IN
SY-22, 14 | 14 | H: T-BRAKE OFF IN
SY-22, 17 | 17 | H: T-BRAKE ON IN
D5 ERA81-004
D6 1S2837
D7 10E-2
D8 RD15FB3
R7 10K
R8 10K
R10 330
R11 1K
R12 330
T-BRAKE SOL. COMMON | 7 | SY-22, 7
L: T-BRAKE SOL. OFF OUT | 5 | SY-22, 5
L: T-BRAKE SOL. ON OUT | 6 | SY-22, 6
Q18 DTA114YK
Q21 DTA114YK
Q17 DTC144EK
Q19 2SD1160
Q20 DTC144EK
Q22 2SD1160
TENREG SOL DRIVER
SY-22, 15 | 15 | H: TENREG OFF IN
SY-22, 16 | 16 | H: TENREG ON IN
D9 10E-2
D10 RD15FB3
R13 10K
R14 10K
R15 330
R16 330
SOL. COMMON (UNREG 12V) | 10 | SY-22, 10
L: TENREG SOL. OFF OUT | 8 | SY-22, 8
L: TENREG SOL. ON OUT | 9 | SY-22, 9
Q25 DTA114YK
Q28 DTC144EK
Q30 2SD1160
Q24 DTC144EK
Q26 2SD1160
Q27 DTC144EK
Q29 DTA114YK
S-BRAKE SOL DRIVER
SY-22, 22 | 22 | +12V IN
SY-22, 24 | 24 | H: S-BRAKE OFF IN
SY-22, 26 | 26 | H: S-BRAKE ON IN
SY-22, 27 | 27 | H: UNREG DIP DET OUT
D11 ERA81-004
D12 1S2837
D13 10E-2
D14 RD15FB3
R17 10K
R18 10K
R20 330
R21 1K
R22 330
S-BRAKE SOL. COMMON | 31 | SY-22, 31
L: S-BRAKE SOL. OFF OUT | 32 | SY-22, 32
L: S-BRAKE SOL. ON OUT | 33 | SY-22, 33
Q43 DTA114YK
D20 1S2837
R32 100
C2 47 16V
R34 4700
C3 3.3 25V
R31 10K
Q32 DTA114YK
Q35 DTA114YK
Q31 DTC144EK
Q33 2SD1160
Q34 DTC144EK
Q36 2SD1160
T-IDLER SOL DRIVER
SY-22, 20 | 20 | H: T-IDLER OFF IN
SY-22, 21 | 21 | H: T-IDLER ON IN
D15 10E-2
D16 RD15FB3
R23 10K
R24 10K
R25 330
R26 330
L: T-IDLER SOL. OFF OUT | 11 | SY-22, 11
L: T-IDLER SOL. ON OUT | 12 | SY-22, 12
DTC114EK
DTA114YK
Q38 DTA114YK
Q41 DTA114YK
Q37 DTC144EK
Q39 2SD1160
Q40 DTC144EK
Q42 2SD1160
S-IDLER SOL DRIVER
SY-22, 23 | 23 | H: S-IDLER OFF IN
SY-22, 19 | 19 | H: S-IDLER ON IN
D17 10E-2
D18 RD15FB3
R27 10K
R28 10K
R29 330
R30 330
SOL. COMMON (UNREG 12V) | 28 | SY-22, 28
L: S-IDLER SOL. OFF OUT | 29 | SY-22, 29
L: S-IDLER SOL. ON OUT | 30 | SY-22, 30
IC1 IC2
TC4050BF×2
VCC 1 GND
VCC 2 GND
C1 0.047
SY-22, 1 | 1 | UNSW +5V IN
SY-22, 2 | 2 | GND
UNREG GND | 37 | SY-22, 37
UNREG GND | 38 | SY-22, 38
SY-23
1-613-101-15
BVU-150P
BVU-150

FRAME (1/2)


KY-86
SWB-4
SY-18C
WITH DUS-33
SY-22A
SY-23
LE-21
DUS-5
DUS-5
LE-20
DUS-4
THREADING
TENREG
DRUM BLOCK
PA-45
ROTARY TRANS
RP-24
CAPSTAN MOTOR BLOCK
MOTOR CONT CIRCUIT
PC-22
PC-22
SV-57C
FOR METER CH-1
FOR METER CH-2
CN1006 EARPHONE
CN1011 REMOTE
ME1001 VIDEO/BATT/AUDIO CH-1
ME1002 AUDIO CH-2


DRUM BLOCK
LE-21
TAPE END DET
DUS-5
DUS-5
TAPE BEGIN DET
LE-20
SY-22A
DUS-4
THREADING
M1003
TENREG
S1002 CASSETTE IN
S1003 MISS REC
S1004 CASSETTE LOCK
THREAD END S1005
S1007 UNTH END
S1006 EJECT
PM1001 PINCH
PM1002 T-BRAKE
PM1003 TENREG
PM1004 S-BRAKE
PM1005 T-IDLER
PM1006 S-IDLER
PA-45
CHASSIS
VIDEO CH-A
VIDEO CH-B
ROTARY TRANS
M1004 DRUM
SPEED PG-A
SPEED PG-B
PHASE PG
M1002 REEL
CAPSTAN MOTOR BLOCK
M1001
MOTOR CONT CIRCUIT
T-REEL FG
S-REEL FG
PC-22
PC-22
SY-23
RP-24
SV-57C
VO-12 WITH BF-12, CR-26, IF-99 and VA-29
YC-20
S1008 SP
CN1009 VIDEO OUT 2
CN1010 VIDEO OUT 1
CN1013 OFF TAPE OUT
CN1014 EXT SC IN
DUS-70
CN1012 LINE VIDEO IN
CN1005 CAMERA
-EXT VIEW-
FRAME (2/2)
FRAME (2/2)
FRAME (1/2)
BVU-150P 1st, 2nd

FRAME (2/2)


H1003
FULL ERASE
H1002
CTL R/P
CH-1 ERASE
AUDIO CH-2 R/P
AUDIO CH-1 R/P
DU-58
FRAME (1/2)
AU-51A
WITH DUS-3
CN36 (436)
CN30 (430)
CN31 (431)
CN32 (432)
CN33 (433)
CN34 (434)
CN1007
AUDIO CH-1 OUT
CN1008
AUDIO CH-2 OUT
TRACKING
RV1
100K
DUS-6
DUS-69
RV1
10K
AU-49A
CM-19A
CN73 (473)
CN74 (474)
CN75 (475)
CN71 (471)
CN72 (472)
CN1001
MIC CH-1 IN
CN1002
MIC CH-2 IN
CN1003
DC IN
S1001
POWER
CN-26
S1017
BATTERY
12V
H1004
TIMECODE
CN1015
TC IN
CN1016
TCOUT
TM-19
CN-100
C1
0.47F/5.5V
S1010
CASSETTE LOCK
S1010 S/N 10021-
PSB-4
WITH PA 48
AU-65
WITH DUS-94
S1009
DOLBY
AU-64
WITH DUS-94
FRAME (2/2)
BVU-150P 1st, 2nd
FRAME (1/2)

SECTION 16
PRINTED WIRING BOARDS

CIRCUIT FUNCTION OF THE PRINTED CIRCUIT BOARDS

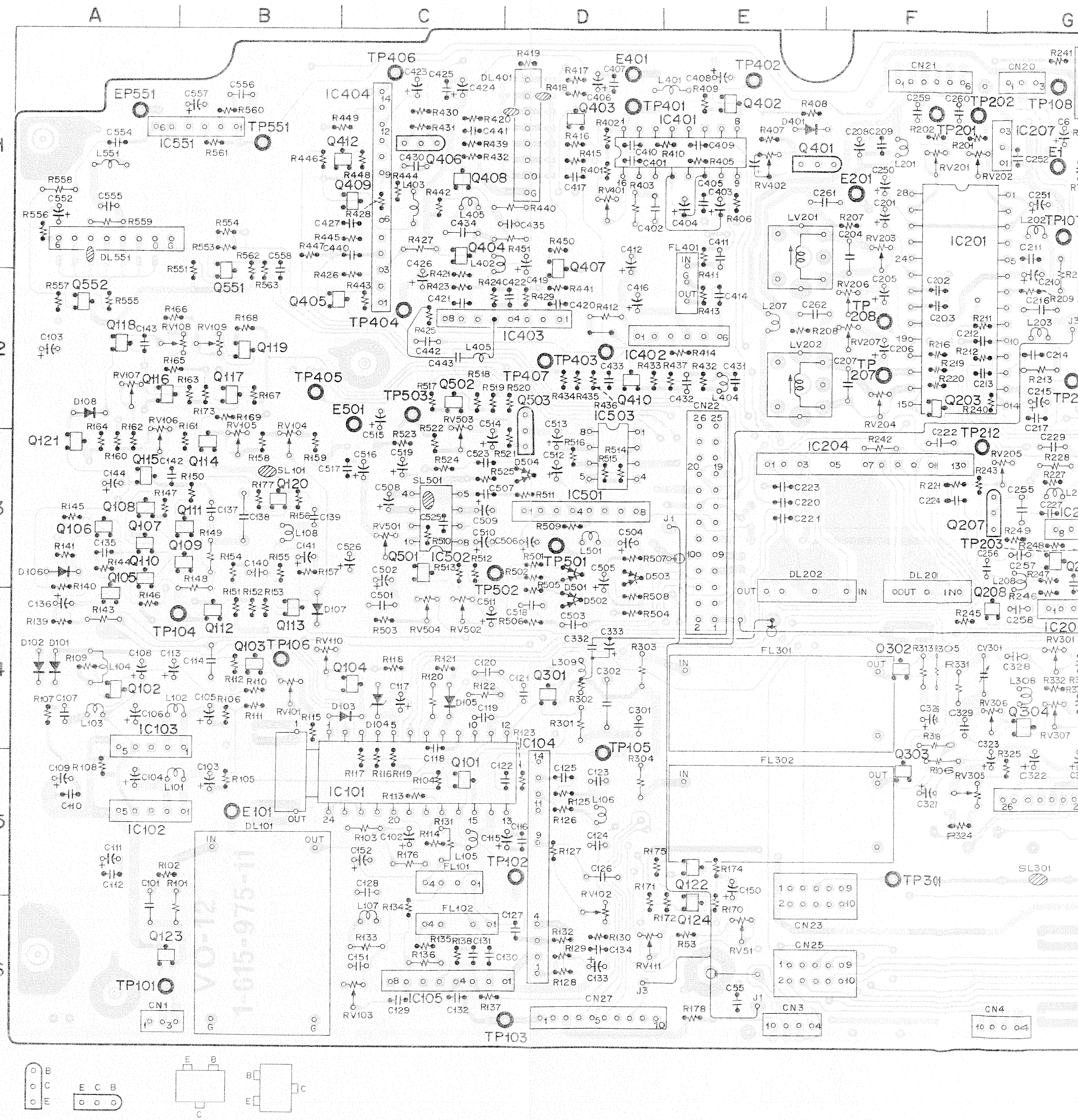
The circuit information is provided below.

SYSTEM	CIRCUIT BOARD	CIRCUIT FUNCTION
VIDEO	VO-12	. Y MOD/Demodulator
	IF-99	. RF Check board
	BF-12	. View Finder
	YC-20	. Y/C Separator
	CR-26	. Chroma MOD/Demodulator
	VA-29	. Y/C Mix, Video Output
	RP-24	. Video REC/PB Amplifier
AUDIO	AU-49A	. Audio REC/PB Amplifier
	DUS-69	
	DUS-6	. Tracking VR
	AU-64	. Audio CH-1 Dolby
	AU-65	. Audio CH-2 Dolby
	DUS-94	. VAR,Inductor
	DU-58	. Audio R/P/Erase, CTL Head
	AU-51A	. BIAS/Erase OSC, REC/PB Control
	DUS-3	. VAR,Inductor
	CM-19A	. Camera/MIC Input Select
	DUS-70	. Camera Input
	SWB-4	. Audio Level/Meter Select
SERVO	SV-57C	. Drum/Capstan/Reel Servo
	PC-22	. S/T-Reel FG Gen.
POWER	PSB-4	. Power Supply/Time Code REC Amplifier
	TM-19	. Hours Meter
	CN-26	. DC In Connector
	CN-100	. Backup Capacitor
KEY	KY-68	. Function Key/Display
	PA-48	. Time Code PB Amplifier
SYSTEM CONTROL	SY-18C	. System Control
	DUS-33	. VAR,Inductor
	DUS-5	. Solar Battery
	LE-20	. LED For Tape Begin/End DET
	LE-21	. LED For Tape Begin/End DET
	SY-22A	. System Control
	DUS-4	. Tenreg SW
	SY-23	. Solenoid Driver

CN1	A - 6
CN3	E - 6
CN4	G - 6
CN6	H - 6
CN7	I - 6
CN8	I - 5
CN9	I - 5
CN10	I - 4
CN11	I - 4
CN12	I - 3
CN13	I - 3
CN14	I - 2
CN15	I - 1
CN16	I - 1
CN17	H - 1
CN18	H - 1
CN19	G - 1
CN20	G - 1
CN21	F - 1
CN22	E - 2
CN23	E - 6
CN24	I - 5
CN25	E - 6
CN26	I - 6
CN27	D - 6
CV301	G - 4
CV302	H - 4
D1	H - 1
D2	G - 2
D3	H - 1
D101	A - 4
D102	A - 4
D103	C - 4
D104	C - 4
D105	C - 4
D106	A - 3
D107	B - 4
D108	A - 2
D201	H - 3
D401	E - 1
D501	D - 3
D502	D - 4
D503	D - 3
D504	D - 3
DL101	B - 5
DL201	F - 3
DL202	E - 3
DL401	D - 1
DL551	A - 1
E1	G - 1
E51	H - 5
E101	B - 5
E201	F - 1
E301	I - 4
E401	D - 1
E501	C - 2
EP551	A - 1
FL101	C - 5
FL102	C - 6
FL201	H - 3
FL202	H - 3
FL301	E - 4
FL302	E - 5
FL401	E - 1
IC1	H - 2
IC2	H - 2
IC101	C - 5
IC102	A - 5
IC103	A - 4
IC104	D - 5
IC105	C - 6
IC201	F - 1
IC202	I - 3
IC203	H - 2
IC204	F - 3
IC205	G - 3
IC206	G - 4
IC207	G - 1
IC301	H - 4
IC302	H - 4
IC303	H - 5
IC304	G - 5
IC401	E - 1
IC402	D - 2
IC403	C - 2
IC404	C - 1
IC501	D - 3
IC502	C - 3
IC503	D - 2
IC551	B - 1
LV201	E - 1
LV202	E - 2
LV203	H - 1
Q1	H - 1
Q2	H - 1
Q3	G - 1
Q4	G - 1
Q6	H - 1
Q7	H - 1
Q51	I - 1
Q101	C - 5
Q102	A - 4
Q103	B - 4
Q104	C - 4
Q105	A - 3
Q106	A - 3
Q107	A - 3
Q108	A - 3
Q109	B - 3
Q110	A - 3
Q111	B - 3
Q112	B - 4
Q113	B - 4
Q114	B - 3
Q115	A - 3
Q116	A - 2
Q117	B - 2
Q118	A - 2
Q119	B - 2
Q120	B - 3
Q121	A - 3
Q122	E - 5
Q123	A - 6
Q124	E - 6
Q201	I - 1
Q202	I - 3
Q203	F - 2
Q204	H - 3
Q205	H - 2
Q206	I - 2
Q207	G - 3
Q208	G - 4
Q209	G - 3
Q301	D - 4
Q302	F - 4
Q303	F - 5
Q304	G - 4
Q306	H - 4
Q307	H - 4
Q401	E - 1
Q402	E - 1
Q403	D - 1
Q404	C - 1
Q405	B - 2
Q406	C - 1
Q407	D - 1
Q408	C - 1
Q409	C - 1
Q410	D - 2
Q412	C - 1
Q501	C - 3
Q502	C - 2
Q503	D - 2
Q551	B - 2
Q552	A - 2
RV1	G - 1
RV51	E - 6
RV101	B - 4
RV102	D - 6
RV103	C - 6
RV104	B - 3
RV105	B - 3
RV106	A - 2
RV107	A - 2
RV108	A - 2
RV109	B - 2
RV110	B - 4
RV111	D - 6
RV201	F - 1
RV202	F - 1
RV203	F - 1
RV204	F - 2
RV205	G - 3
RV206	F - 2
RV207	F - 2
RV301	G - 4
RV304	H - 4
RV305	F - 5
RV306	G - 4
RV307	G - 4
RV401	D - 1
RV402	E - 1
RV501	C - 3
RV502	C - 4
RV503	C - 2
RV504	C - 4
SL101	B - 3
SL301	G - 5
SL501	C - 3
TP1	H - 1
TP2	I - 5
TP51	I - 1
TP52	H - 6
TP53	I - 6
TP101	A - 6
TP102	D - 5
TP103	D - 6
TP104	B - 4
TP105	D - 4
TP106	B - 4
TP107	G - 1
TP108	G - 1
TP201	F - 1
TP202	F - 1
TP204	G - 2
TP205	H - 3
TP206	I - 4
TP207	F - 2
TP208	F - 2
TP209	I - 3
TP210	I - 4
TP211	H - 4
TP212	F - 3
TP301	F - 5
TP401	D - 1
TP402	E - 1
TP403	D - 2
TP404	C - 2
TP405	B - 2
TP406	C - 1
TP407	D - 2
TP501	D - 3
TP502	C - 3
TP503	C - 2
TP551	B - 1
X301	I - 4

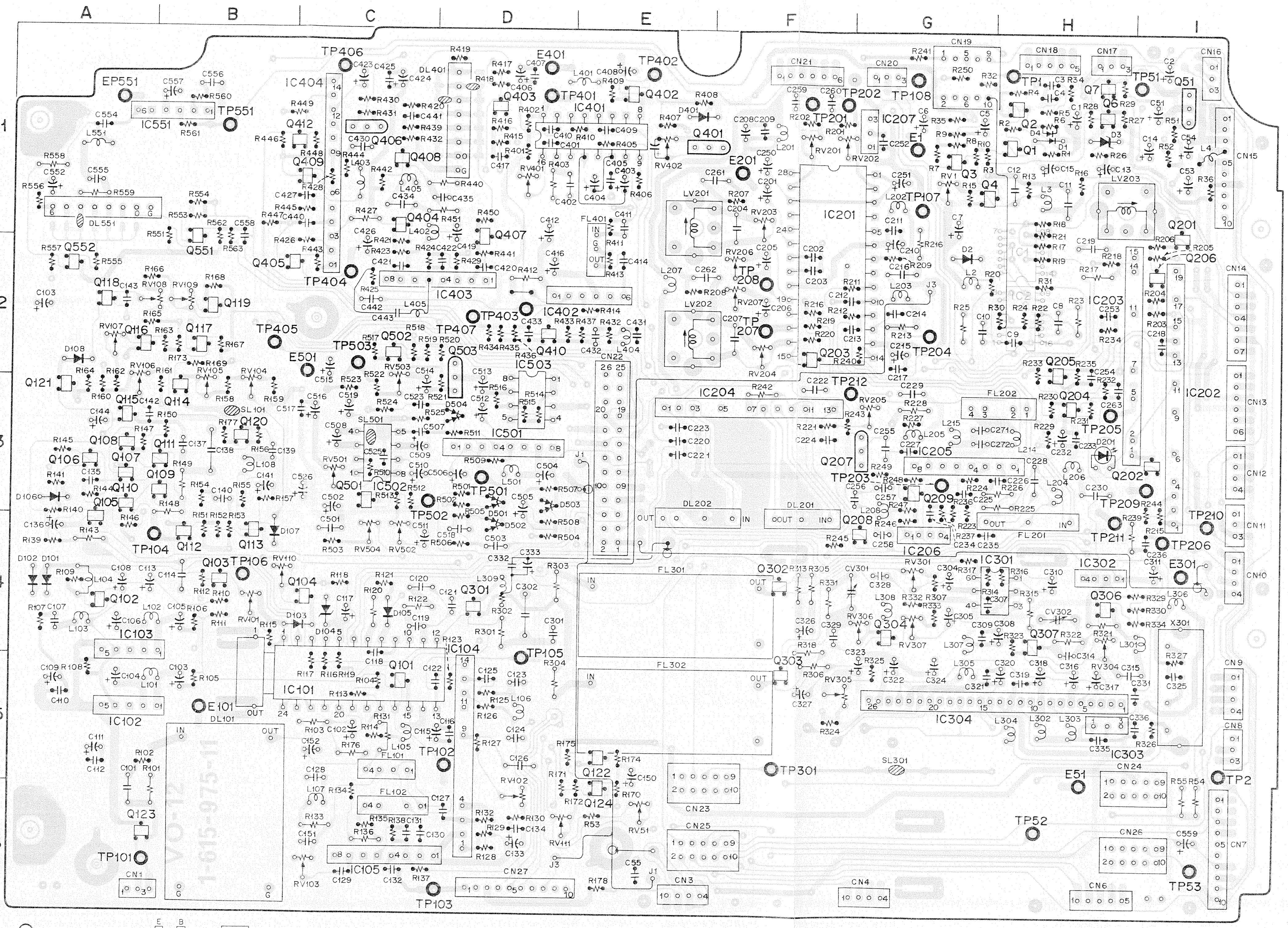
VO-12 (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

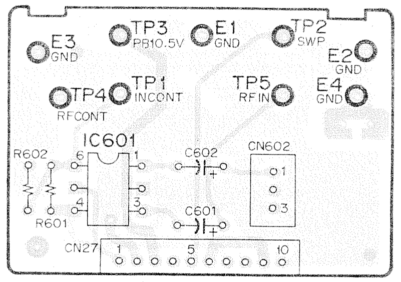
S/N; UP TO 10020



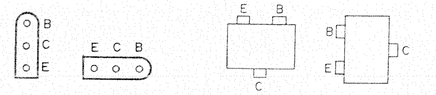
VO-12 (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

S/N: UP TO 10020





IF-99 -SOLDERING SIDE-
1-616-334-11
BVU-150P

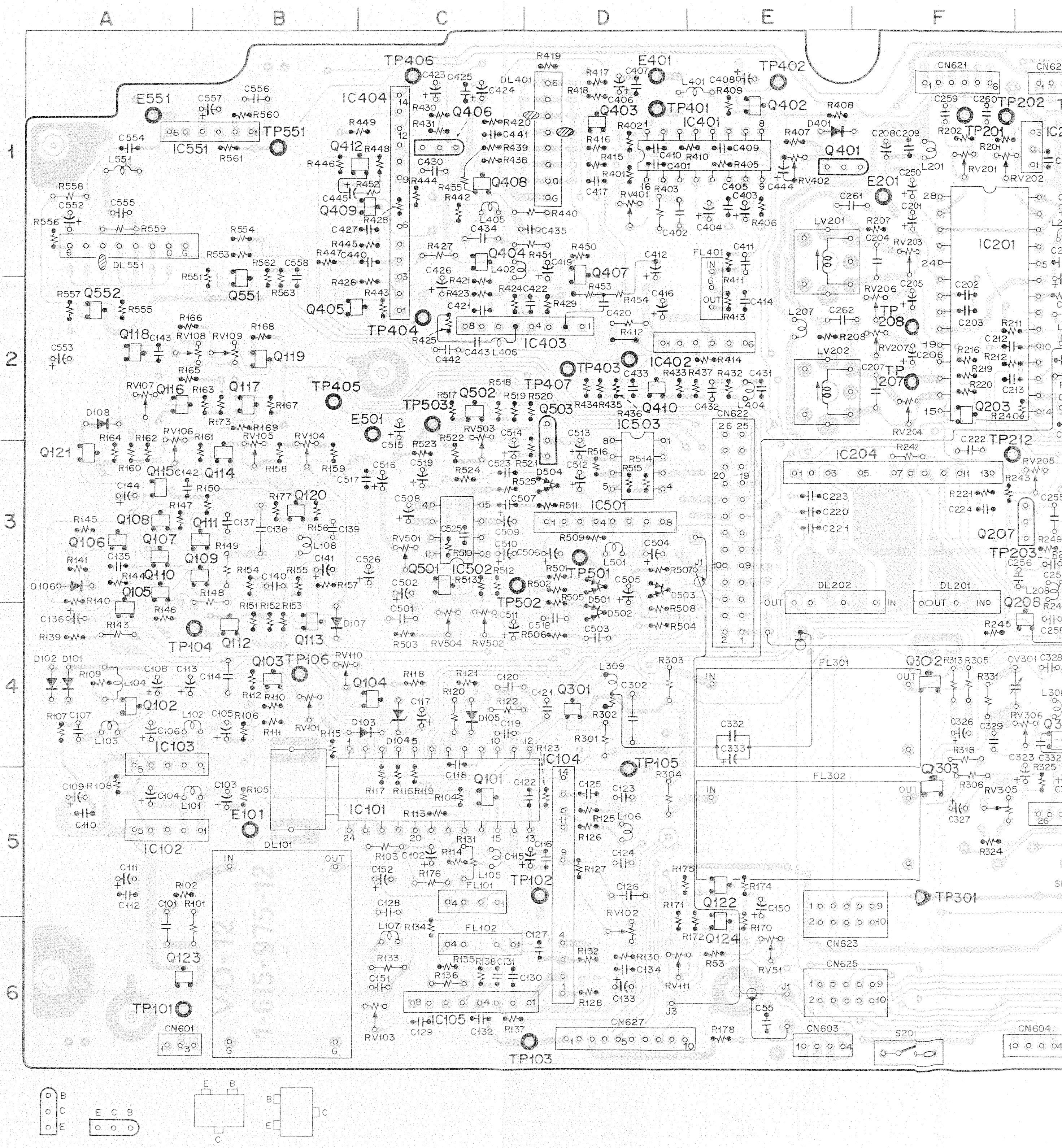


VO-12 -SOLDERING SIDE-
1-615-975-11
BVU-150P

CN601	A - 6
CN603	E - 6
CN604	G - 6
CN606	H - 6
CN607	I - 6
CN608	I - 5
CN609	I - 5
CN610	I - 4
CN611	I - 4
CN612	I - 3
CN613	I - 3
CN614	I - 2
CN615	I - 1
CN616	I - 1
CN617	H - 1
CN618	H - 1
CN619	G - 1
CN620	G - 1
CN621	F - 1
CN622	E - 2
CN623	E - 6
CN624	I - 5
CN625	E - 6
CN626	I - 6
CN627	D - 6
CV301	G - 4
CV302	H - 4
D1	H - 1
D2	G - 2
D3	H - 1
D101	A - 4
D102	A - 4
D103	C - 4
D104	C - 4
D105	C - 4
D106	A - 3
D107	B - 4
D108	A - 2
D201	H - 3
D401	E - 1
D501	D - 3
D502	D - 4
D503	D - 3
D504	D - 3
DL101	B - 5
DL201	F - 3
DL202	E - 3
DL401	D - 1
DL551	A - 1
E1	G - 1
E51	H - 5
E101	B - 5
E201	F - 1
E301	I - 4
E401	D - 1
E501	C - 2
EP551	A - 1
FL101	C - 5
FL102	C - 6
FL201	H - 3
FL202	H - 3
FL301	E - 4
FL302	E - 5
FL401	E - 1
IC1	H - 2
IC2	H - 2
IC101	C - 5
IC102	A - 5
IC103	A - 4
IC104	D - 5
IC105	C - 6
IC201	F - 1
IC202	I - 3
IC203	H - 2
IC204	F - 3
IC205	G - 3
IC206	G - 4
IC207	G - 1
IC301	H - 4
IC302	H - 4
IC303	H - 5
IC304	G - 5
IC401	E - 1
IC402	D - 2
IC403	C - 2
IC404	C - 1
IC501	D - 3
IC502	C - 3
IC503	D - 2
IC551	B - 1
LV201	E - 1
LV202	E - 2
LV203	H - 1
Q1	H - 1
Q2	H - 1
Q3	G - 1
Q4	G - 1
Q6	H - 1
Q7	H - 1
Q51	I - 1
Q101	C - 5
Q102	A - 4
Q103	B - 4
Q104	C - 4
Q105	A - 3
Q106	A - 3
Q107	A - 3
Q108	A - 3
Q109	B - 3
Q110	A - 3
Q111	B - 3
Q112	B - 4
Q113	B - 4
Q114	B - 3
Q115	A - 3
Q116	A - 2
Q117	B - 2
Q118	A - 2
Q119	B - 2
Q120	B - 3
Q121	A - 3
Q122	E - 5
Q123	A - 6
Q124	E - 6
Q201	I - 1
Q202	I - 3
Q203	F - 2
Q204	H - 3
Q205	H - 2
Q206	I - 2
Q207	G - 3
Q208	G - 4
Q209	G - 3
Q301	D - 4
Q302	F - 4
Q303	F - 5
Q304	G - 4
Q306	H - 4
Q307	H - 4
Q401	E - 1
Q402	E - 1
Q403	D - 1
Q404	C - 1
Q405	B - 2
Q406	C - 1
Q407	D - 1
Q408	C - 1
Q409	C - 1
Q410	D - 2
Q412	C - 1
Q501	C - 3
Q502	C - 2
Q503	D - 2
Q551	B - 2
Q552	A - 2
RV1	G - 1
RV51	E - 6
RV101	B - 4
RV102	D - 6
RV103	C - 6
RV104	B - 3
RV105	B - 3
RV106	A - 2
RV107	A - 2
RV108	A - 2
RV109	B - 2
RV110	B - 4
RV111	D - 6
RV201	F - 1
RV202	F - 1
RV203	F - 1
RV204	F - 2
RV205	G - 3
RV206	F - 2
RV207	F - 2
RV208	H - 3
RV301	G - 4
RV304	H - 4
RV305	F - 5
RV306	G - 4
RV307	G - 4
RV401	D - 1
RV402	E - 1
RV501	C - 3
RV502	C - 4
RV503	C - 2
RV504	C - 4
S201	F - 6
SL101	B - 3
SL301	G - 5
SL501	C - 3
TP1	H - 1
TP2	I - 5
TP51	I - 1
TP52	H - 6
TP53	I - 6
TP101	A - 6
TP102	D - 5
TP103	D - 6
TP104	B - 4
TP105	D - 4
TP106	B - 4
TP107	G - 1
TP108	G - 1
TP201	F - 1
TP202	F - 1
TP204	G - 2
TP205	H - 3
TP206	I - 4
TP207	F - 2
TP208	F - 2
TP209	I - 3
TP210	I - 4
TP211	H - 4
TP212	F - 3
TP301	F - 5
TP401	D - 1
TP402	E - 1
TP403	D - 2
TP404	C - 2
TP405	B - 2
TP406	C - 1
TP407	D - 2
TP501	D - 3
TP502	C - 3
TP503	C - 2
TP551	B - 1
X301	I - 4

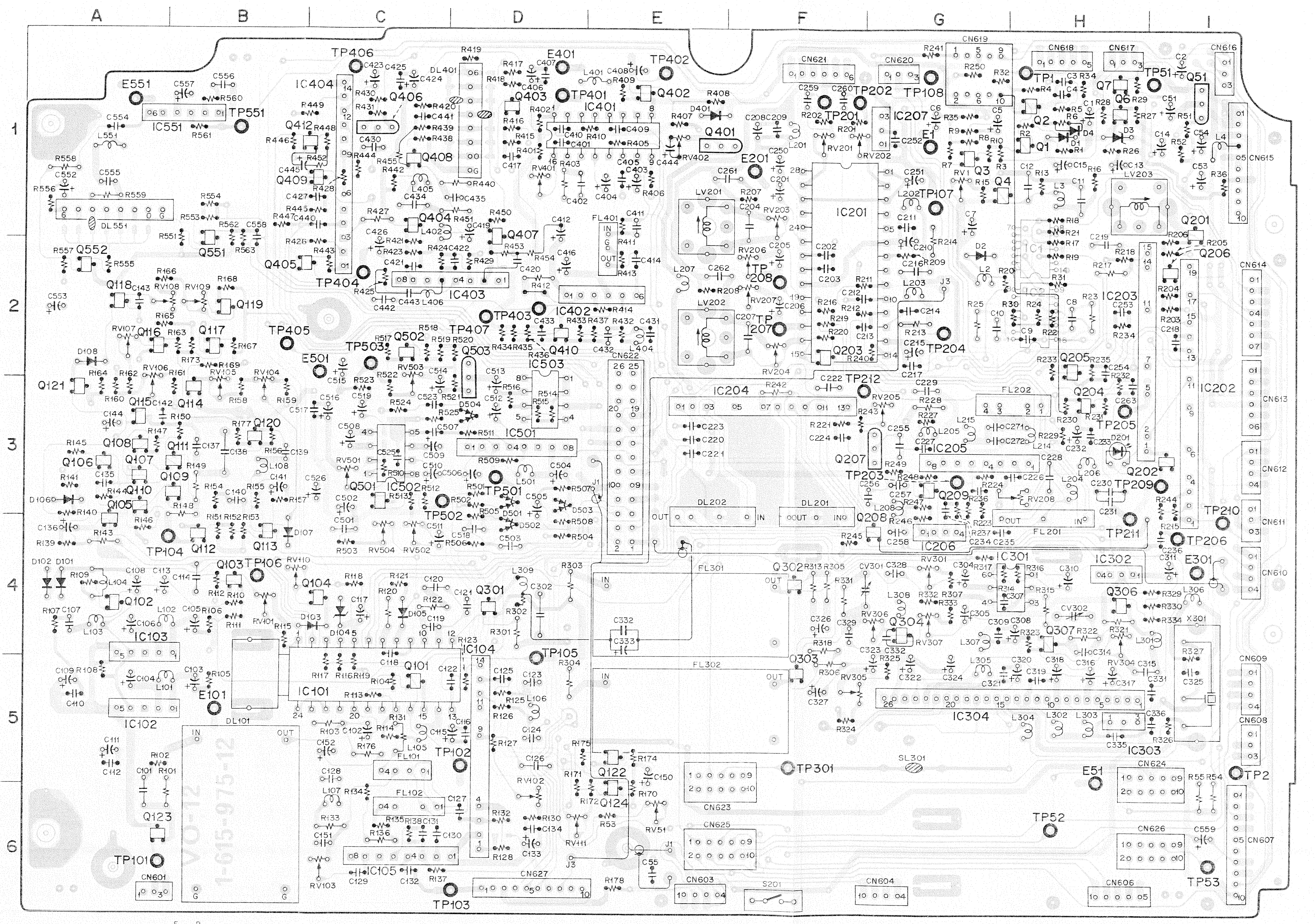
VO-12 (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

S/N; 10021 to 10190

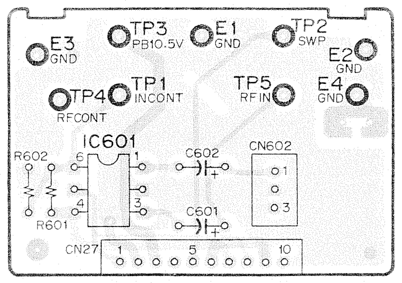


VO-12 (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

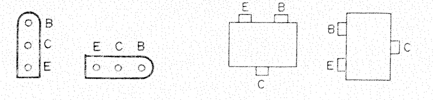
S/N; 10021 to 10190



VO-12-SOLDERING SIDE-
1-615-975-12
BVU-150P



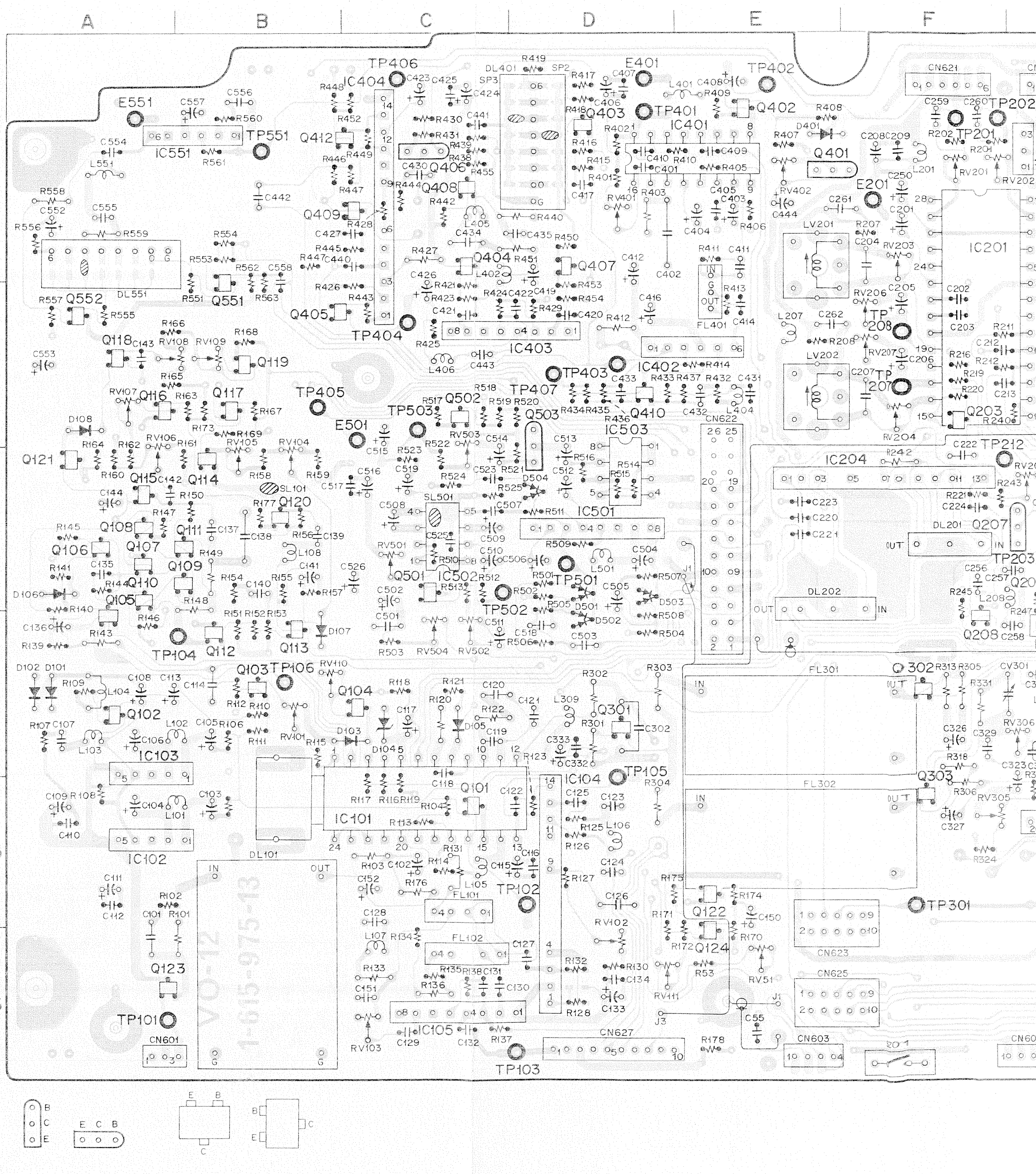
IF-99-SOLDERING SIDE-
1-616-334-11
BVU-150P
BVU-150



CN601	A - 6
CN603	E - 6
CN604	G - 6
CN606	H - 6
CN607	I - 6
CN608	I - 5
CN609	I - 5
CN610	I - 4
CN611	I - 4
CN612	I - 3
CN613	I - 3
CN614	I - 2
CN615	I - 1
CN616	I - 1
CN617	H - 1
CN618	H - 1
CN619	G - 1
CN620	G - 1
CN621	F - 1
CN622	E - 2
CN623	E - 6
CN624	I - 5
CN625	E - 6
CN626	I - 6
CN627	D - 6
CV301	G - 4
CV302	H - 4
D1	H - 1
D2	G - 2
D3	H - 1
D4	H - 1
D101	A - 4
D102	A - 4
D103	C - 4
D104	C - 4
D105	C - 4
D106	A - 3
D107	B - 4
D108	A - 2
D201	H - 3
D202	G - 3
D401	E - 1
D501	D - 3
D502	D - 4
D503	D - 3
D504	D - 3
DL101	B - 5
DL201	F - 3
DL202	E - 3
DL401	D - 1
DL551	A - 1
E1	G - 1
E51	H - 5
E101	B - 5
E201	F - 1
E301	I - 4
E401	D - 1
E501	C - 2
E551	A - 1
FL101	C - 5
FL102	C - 6
FL201	H - 3
FL202	H - 3
FL301	E - 4
FL302	E - 5
FL401	E - 2
IC1	H - 2
IC2	H - 2
IC101	C - 5
IC102	A - 5
IC103	A - 4
IC104	D - 5
IC105	C - 6
IC201	F - 1
IC202	I - 3
IC203	H - 2
IC204	F - 3
IC205	G - 3
IC206	G - 4
IC207	G - 1
IC301	H - 4
IC302	H - 4
IC303	H - 5
IC304	G - 5
IC401	E - 1
IC402	D - 2
IC403	D - 2
IC404	C - 1
IC501	D - 3
IC502	C - 3
IC503	D - 2
IC551	B - 1
LV201	E - 1
LV202	E - 2
LV203	H - 1
Q1	H - 1
Q2	H - 1
Q3	G - 1
Q4	G - 1
Q6	H - 1
Q7	H - 1
Q51	I - 1
Q52	H - 6
Q101	C - 5
Q102	A - 4
Q103	B - 4
Q104	C - 4
Q105	A - 4
Q106	A - 3
Q107	A - 3
Q108	- 3
Q109	B - 3
Q110	A - 3
Q111	B - 3
Q112	B - 4
Q113	B - 4
Q114	B - 3
Q115	A - 3
Q116	A - 2
Q117	B - 2
Q118	A - 2
Q119	B - 2
Q120	B - 3
Q121	A - 3
Q122	E - 5
Q123	A - 6
Q124	E - 6
Q201	I - 1
Q202	I - 3
Q203	F - 2
Q204	H - 3
Q205	H - 2
Q206	I - 2
Q207	G - 3
Q208	F - 4
Q209	G - 3
Q213	G - 3
Q301	D - 4
Q302	F - 4
Q303	F - 5
Q304	G - 4
Q306	H - 4
Q307	H - 4
Q401	E - 1
Q402	E - 1
Q403	D - 1
Q404	C - 1
Q405	B - 2
Q406	C - 1
Q407	D - 1
Q408	C - 1
Q409	C - 1
Q410	D - 2
Q412	B - 1
Q501	C - 3
Q502	C - 2
Q503	D - 2
Q551	B - 2
Q552	A - 2
RV1	G - 1
RV51	E - 6
RV101	B - 4
RV102	D - 6
RV103	C - 6
RV104	B - 3
RV105	B - 3
RV106	A - 2
RV107	A - 2
RV108	A - 2
RV109	B - 2
RV110	B - 4
RV111	D - 6
RV201	F - 1
RV202	F - 1
RV203	F - 1
RV204	F - 2
RV205	G - 3
RV206	F - 2
RV207	F - 2
RV208	H - 3
RV301	G - 4
RV304	H - 4
RV305	F - 5
RV306	G - 4
RV307	G - 4
RV401	D - 1
RV402	E - 1
RV501	C - 3
RV502	C - 4
RV503	C - 2
RV504	C - 4
S201	F - 6
SL101	B - 3
SL301	G - 5
SL501	C - 3
TP1	H - 1
TP2	I - 5
TP51	I - 1
TP52	H - 6
TP53	I - 6
TP101	A - 6
TP102	D - 5
TP103	D - 6
TP104	B - 4
TP105	D - 4
TP106	B - 4
TP107	G - 1
TP108	G - 1
TP201	F - 1
TP202	F - 1
TP203	G - 3
TP204	G - 2
TP205	H - 3
TP206	I - 4
TP207	F - 2
TP208	F - 2
TP209	I - 3
TP210	I - 4
TP211	H - 4
TP212	F - 3
TP301	F - 5
TP401	D - 1
TP402	E - 1
TP403	D - 2
TP404	C - 2
TP405	B - 2
TP406	C - 1
TP407	D - 2
TP501	D - 3
TP502	C - 3
TP503	C - 2
TP551	B - 1
X301	I - 4

VO-12 (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

S/N; 10191 and higher



H - 4
F - 5
G - 4
G - 4
D - 1
E - 1
C - 3
C - 4
C - 2
C - 4

F - 6

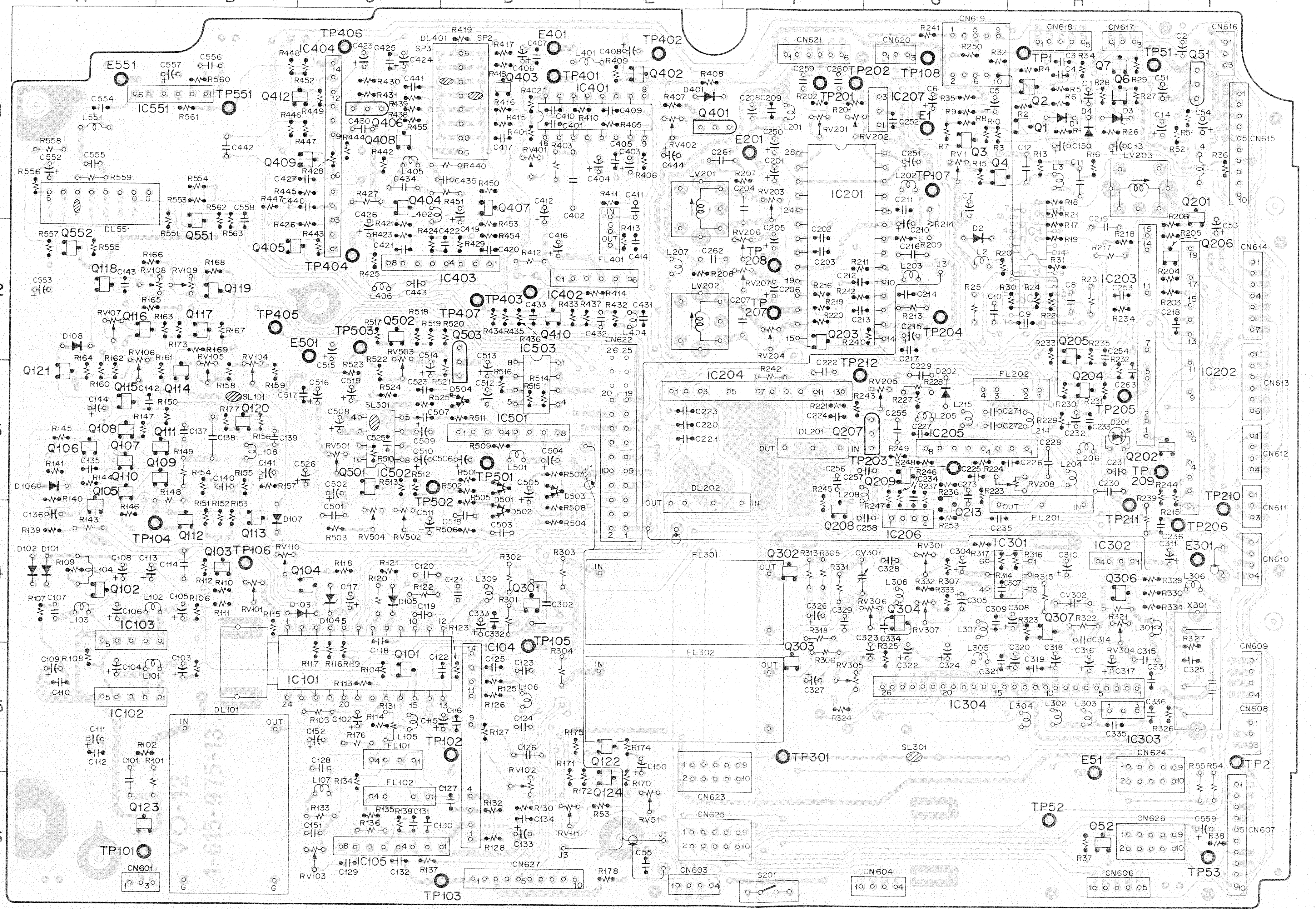
B - 3
G - 5
C - 3

H - 1
I - 5
I - 1
H - 6
I - 6
A - 6
D - 5
D - 6
B - 4
D - 4
B - 4
G - 1
G - 1
F - 1
F - 1
G - 3
G - 2
H - 3
I - 4
F - 2
F - 2
I - 3
I - 4
H - 4
F - 3
F - 5
D - 1
E - 1
D - 2
C - 2
B - 2
C - 1
D - 2
D - 3
C - 3
C - 2
B - 1

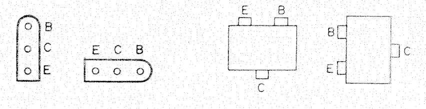
- 4

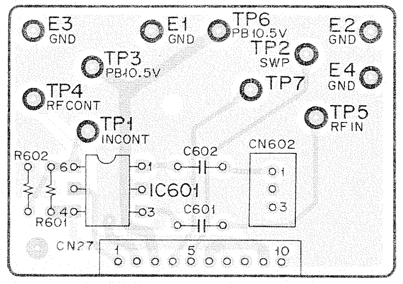
VO-12 (Y MOD/DEMODULATOR)
IF-99 (RF CHECK BOARD)

S/N; 10191 and higher



VO-12 -SOLDERING SIDE-
1-615-975-13
BVU-150P

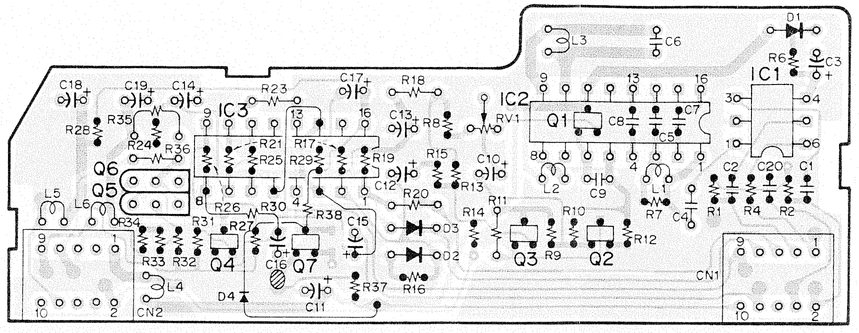


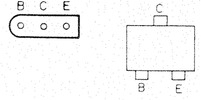


IF-99 -SOLDERING SIDE-
1-616-334-12
BVU-150
BVU-150P

BF-12 (VIEW FINDER)

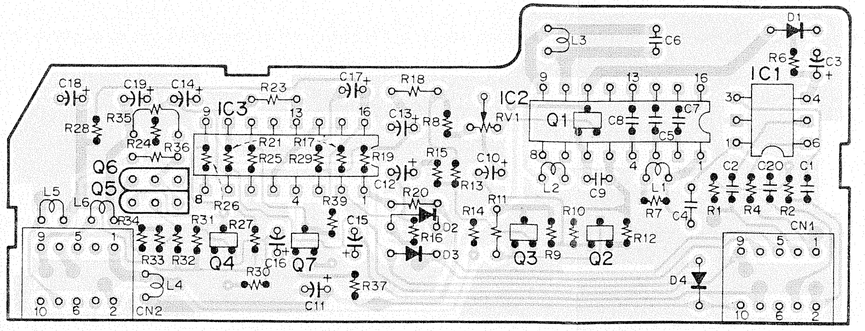
S/N; UP TO 10020

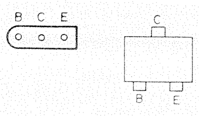




BF-12 -SOLDERING SIDE-
1-615-971-11
BVU-150P

S/N; 10021 and higher



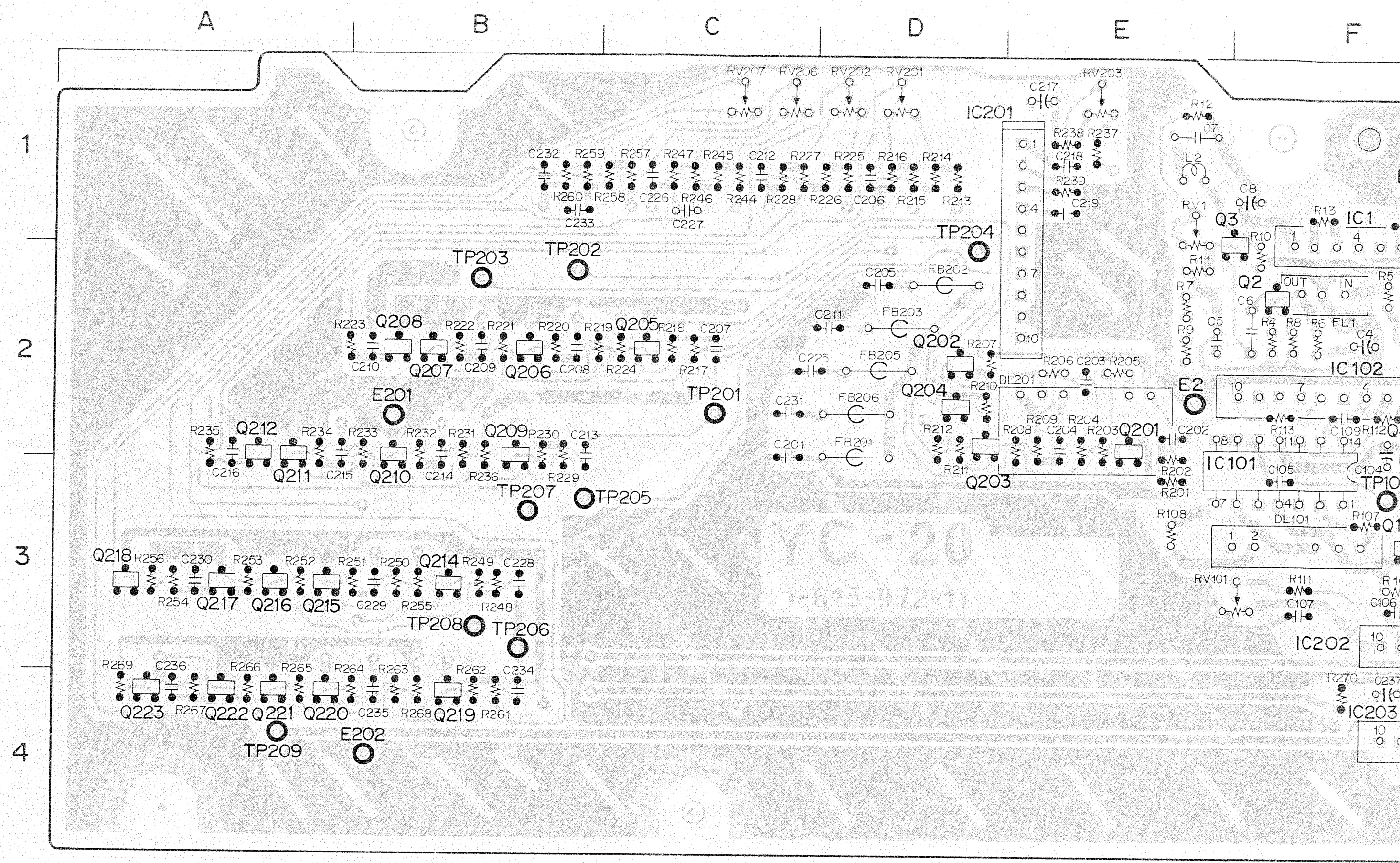


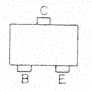
BF-12 -SOLDERING SIDE-
1-615-971-12
BVU-150P
BVU-150

CN1	G - 2
D1	G - 2
DL101	F - 3
DL201	E - 2
E1	F - 1
E2	E - 2
E101	G - 2
E201	B - 2
E202	B - 4
FL1	F - 2
FL201	G - 2
IC1	F - 2
IC101	F - 3
IC102	F - 2
IC201	E - 1
IC202	G - 3
Q1	F - 2
Q2	F - 2
Q3	F - 1
Q101	G - 2
Q102	F - 2
Q103	F - 3
Q201	E - 2
Q202	D - 2
Q203	D - 2
Q204	D - 2
Q205	C - 2
Q206	B - 2
Q207	B - 2
Q208	B - 2
Q209	B - 2
Q210	B - 2
Q211	A - 2
Q212	A - 2
Q213	G - 3
Q214	B - 3
Q215	A - 3
Q216	A - 3
Q217	A - 3
Q218	A - 3
Q219	B - 4
Q220	A - 4
Q221	A - 4
Q222	A - 4
Q223	A - 4
Q224	G - 4
Q225	G - 2
RV1	E - 1
RV101	F - 3
RV201	D - 1
RV202	D - 1
RV203	E - 1
RV204	G - 3
RV205	G - 3
RV206	C - 1
RV207	C - 1
RV208	F - 4
S201	G - 4
TP1	G - 2
TP2	G - 1
TP101	F - 3
TP201	C - 2
TP202	B - 2
TP203	B - 2
TP204	D - 1
TP205	B - 3
TP206	B - 3
TP207	B - 3
TP208	B - 3
TP209	A - 4
TP210	G - 4
TP211	G - 2

YC-20 (Y/C SEPARATOR)

S/N; UP TO 10190

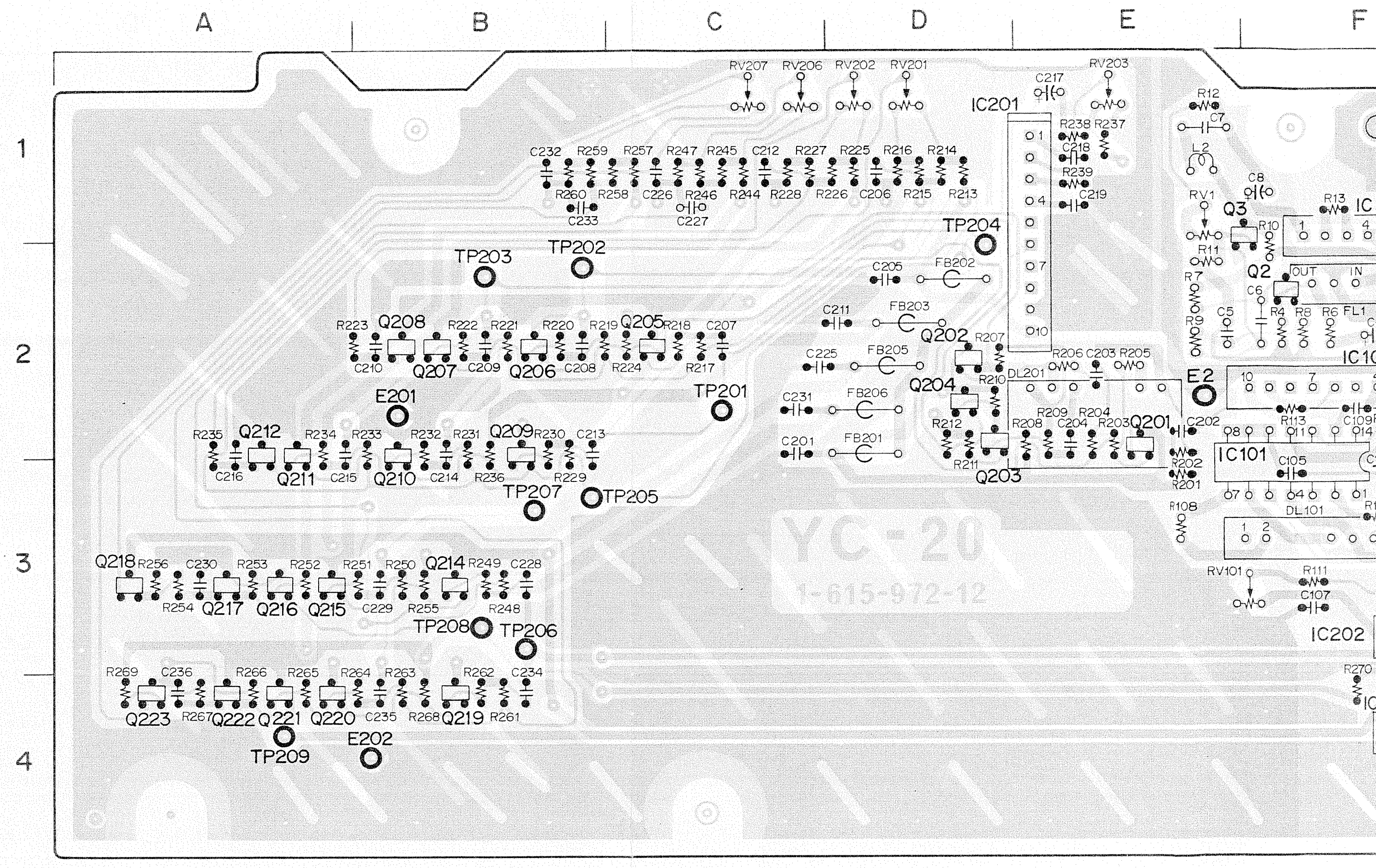


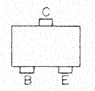


YC-20 (Y/C SEPARATOR)

S/N; 10191 and higher

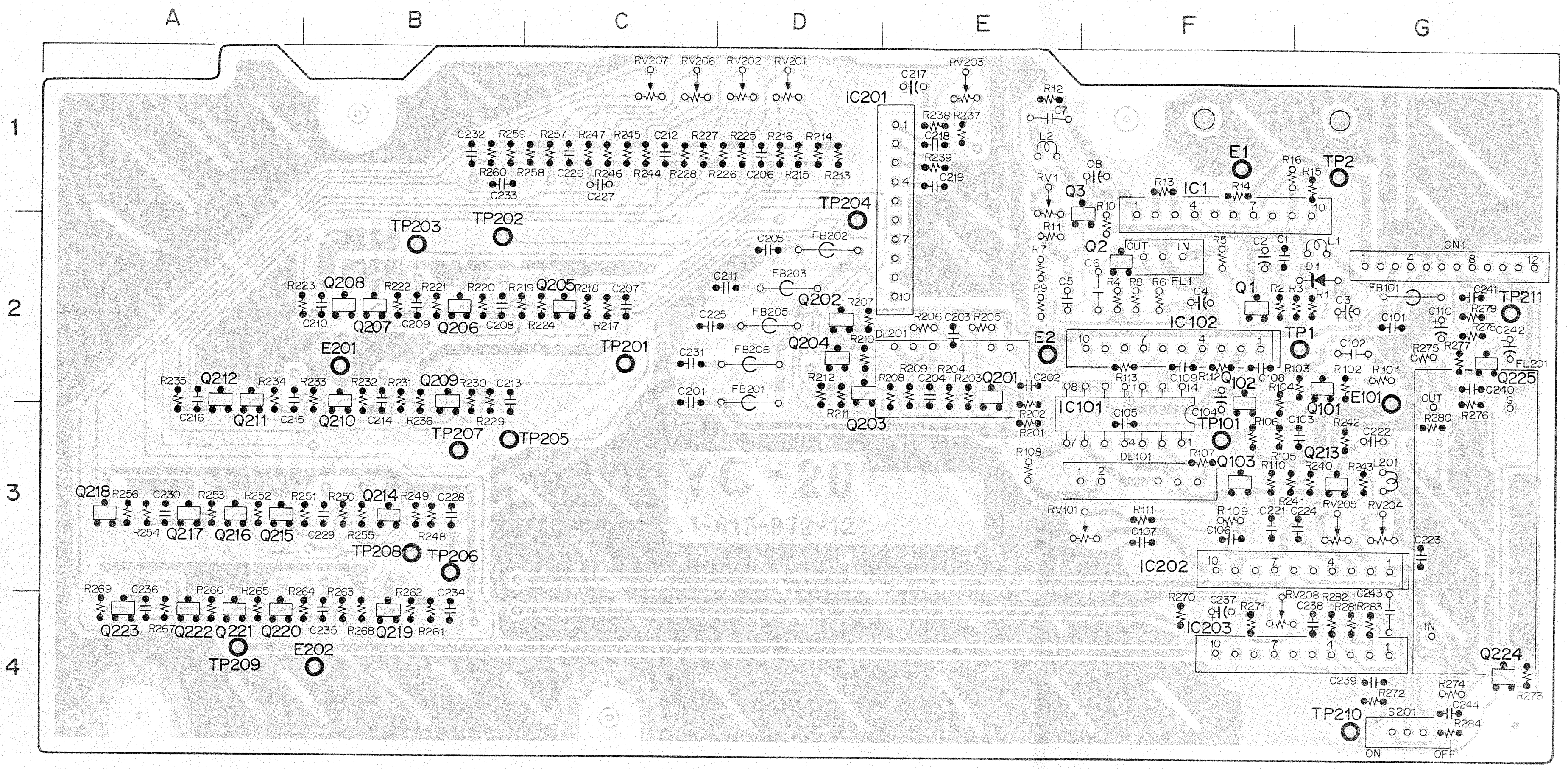
CN1	G - 2
D1	G - 2
DL101	F - 3
DL201	E - 2
E1	F - 1
E2	E - 2
E101	G - 2
E201	B - 2
E202	B - 4
FL1	F - 2
FL201	G - 2
IC1	F - 2
IC101	F - 3
IC102	F - 2
IC201	E - 1
IC202	G - 3
Q1	F - 2
Q2	F - 2
Q3	F - 1
Q101	G - 2
Q102	F - 2
Q103	F - 3
Q201	E - 2
Q202	D - 2
Q203	D - 2
Q204	D - 2
Q205	C - 2
Q206	B - 2
Q207	B - 2
Q208	B - 2
Q209	B - 2
Q210	B - 2
Q211	A - 2
Q212	A - 2
Q213	G - 3
Q214	B - 3
Q215	A - 3
Q216	A - 3
Q217	A - 3
Q218	A - 3
Q219	B - 4
Q220	A - 4
Q221	A - 4
Q222	A - 4
Q223	A - 4
Q224	G - 4
Q225	G - 2
RV1	E - 1
RV101	F - 3
RV201	D - 1
RV202	D - 1
RV203	E - 1
RV204	G - 3
RV205	G - 3
RV206	C - 1
RV207	C - 1
RV208	F - 4
S201	G - 4
TP1	G - 2
TP2	G - 1
TP101	F - 3
TP201	C - 2
TP202	B - 2
TP203	B - 2
TP204	D - 1
TP205	B - 3
TP206	B - 3
TP207	B - 3
TP208	B - 3
TP209	A - 4
TP210	G - 4
TP211	G - 2



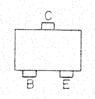


YC-20 (Y/C SEPARATOR)

S/N; 10191 and higher



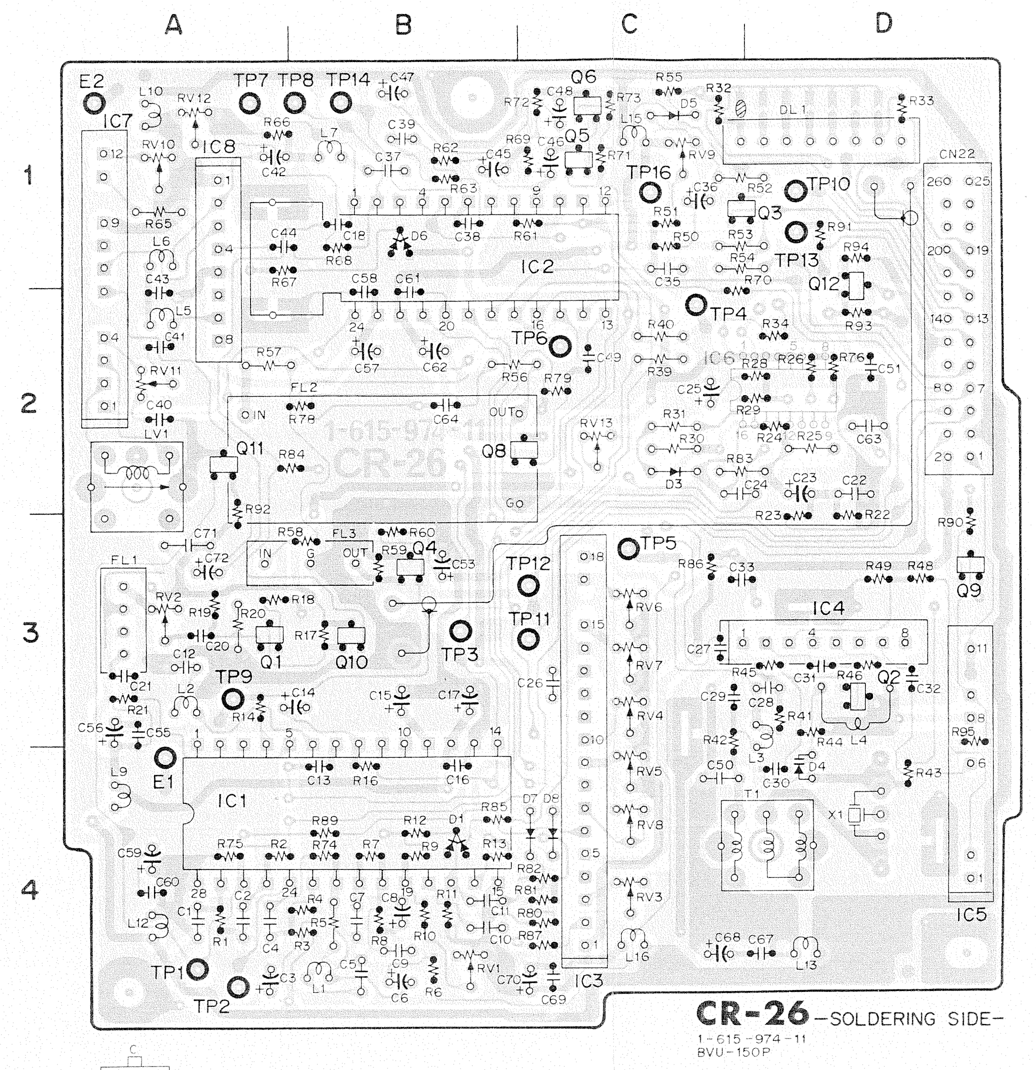
YC-20 – SOLDERING SIDE –
1-615-972-12
BVU-150P



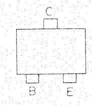
CN22	D - 2
D1	B - 4
D3	C - 2
D4	D - 4
D5	C - 1
D6	B - 1
D7	C - 4
D8	C - 4
DL1	D - 1
E1	A - 4
E2	A - 1
FL1	A - 3
FL2	B - 2
FL3	B - 3
IC1	B - 4
IC2	B - 1
IC3	C - 4
IC4	D - 3
IC5	D - 4
IC6	D - 2
IC7	A - 1
IC8	A - 1
LV1	A - 2
Q1	A - 3
Q2	D - 3
Q3	C - 1
Q4	B - 3
Q5	C - 1
Q6	C - 1
Q8	C - 2
Q9	D - 3
Q10	B - 3
Q11	A - 2
Q12	D - 1
RV1	B - 4
RV2	A - 3
RV3	C - 4
RV4	C - 3
RV5	C - 4
RV6	C - 3
RV7	C - 3
RV8	C - 4
RV9	C - 1
RV10	A - 1
RV11	A - 2
RV12	A - 1
RV13	C - 2
T1	D - 4
TP1	A - 4
TP2	A - 4
TP3	B - 3
TP4	C - 2
TP5	C - 3
TP6	C - 2
TP7	A - 1
TP8	B - 1
TP9	A - 3
TP10	D - 1
TP11	C - 3
TP12	C - 3
TP13	D - 1
TP14	B - 1
TP16	C - 1
X1	D - 4

CR-26 (CHROMA MOD/DEMODULATOR.)

S/N; UP TO 10020



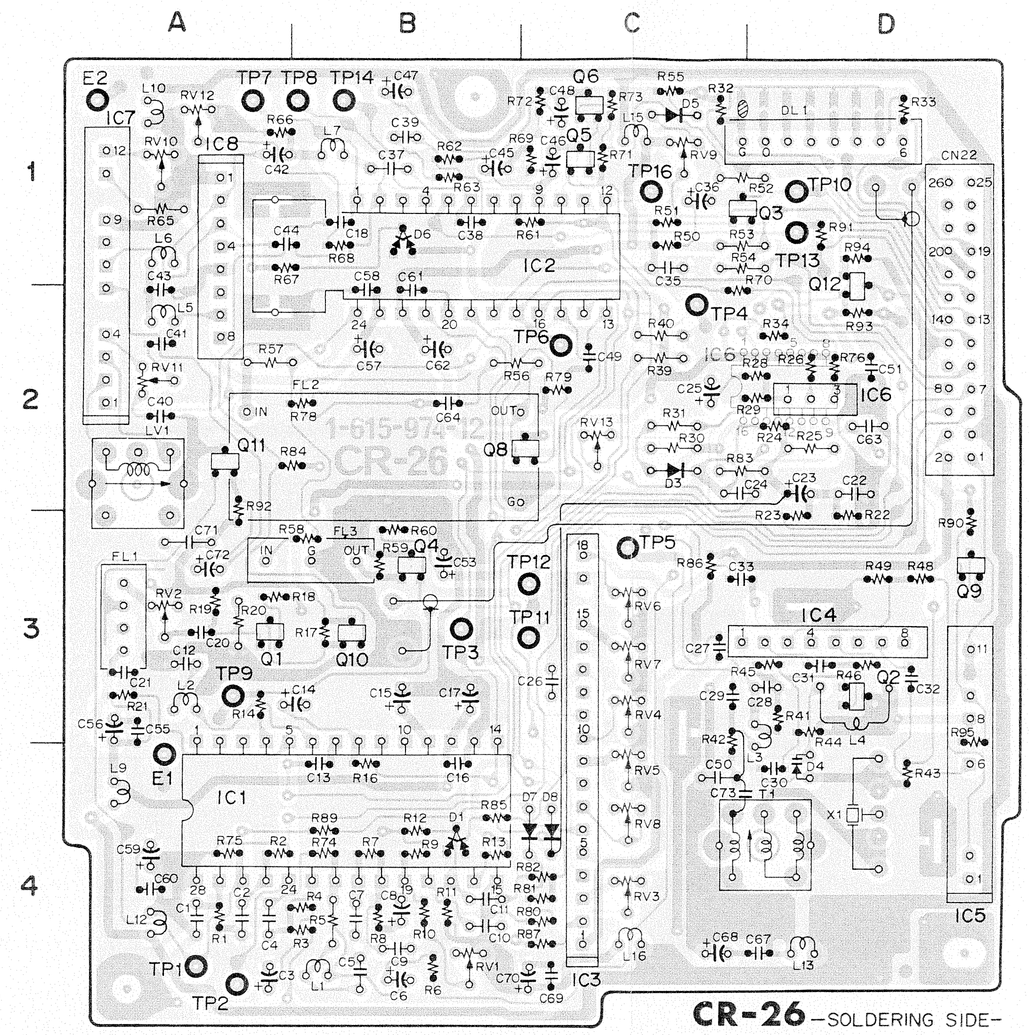
CR-26-SOLDERING SIDE-
1-615-974-11
BVU-150P



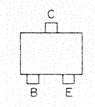
CR-26 (CHROMA MOD/DEMODULATOR)

S/N: 10021 to 10190

CN22	D - 2
D1	B - 4
D3	C - 2
D4	D - 4
D5	C - 1
D6	B - 1
D7	C - 4
D8	C - 4
DL1	D - 1
E1	A - 4
E2	A - 1
FL1	A - 3
FL2	B - 2
FL3	B - 3
IC1	B - 4
IC2	B - 1
IC3	C - 4
IC4	D - 3
IC5	D - 4
IC6	D - 2
IC7	A - 1
IC8	A - 1
LV1	A - 2
Q1	A - 3
Q2	D - 3
Q3	C - 1
Q4	B - 3
Q5	C - 1
Q6	C - 1
Q8	C - 2
Q9	D - 3
Q10	B - 3
Q11	A - 2
Q12	D - 1
RV1	B - 4
RV2	A - 3
RV3	C - 4
RV4	C - 3
RV5	C - 4
RV6	C - 3
RV7	C - 3
RV8	C - 4
RV9	C - 1
RV10	A - 1
RV11	A - 2
RV12	A - 1
RV13	C - 2
T1	D - 4
TP1	A - 4
TP2	A - 4
TP3	B - 3
TP4	C - 2
TP5	C - 3
TP6	C - 2
TP7	A - 1
TP8	B - 1
TP9	A - 3
TP10	D - 1
TP11	C - 3
TP12	C - 3
TP13	D - 1
TP14	B - 1
TP16	C - 1
X1	D - 4



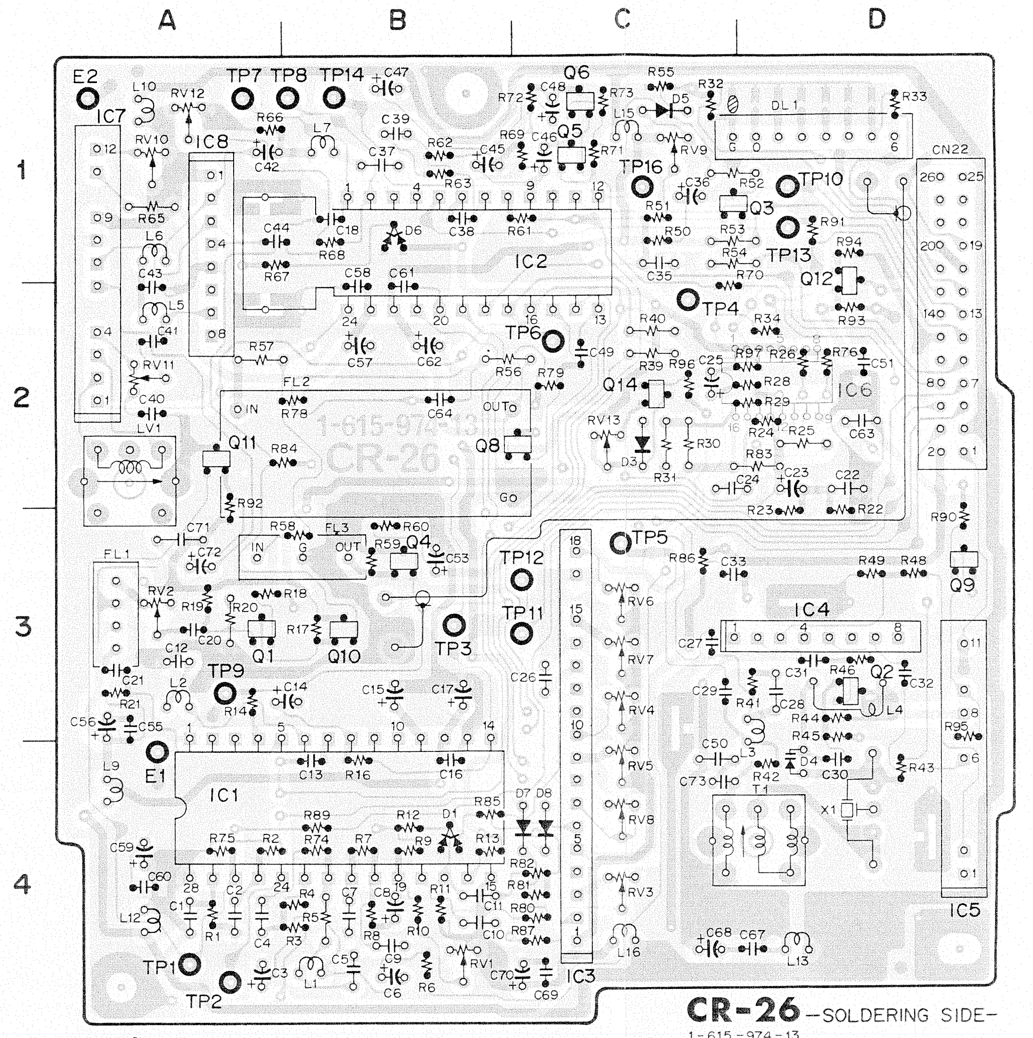
CR-26-SOLDERING SIDE-
1-615-974-12
BVU-150P



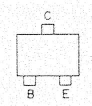
CR-26 (CHROMA MOD/DEMODULATOR)

S/N; 10191 and higher

CN22	D - 2
D1	B - 4
D3	C - 2
D4	D - 4
D5	C - 1
D6	B - 1
D7	C - 4
D8	C - 4
DL1	D - 1
E1	A - 4
E2	A - 1
FL1	A - 3
FL2	B - 2
FL3	B - 3
IC1	B - 4
IC2	B - 1
IC3	C - 4
IC4	D - 3
IC5	D - 4
IC6	D - 2
IC7	A - 1
IC8	A - 1
LV1	A - 2
Q1	A - 3
Q2	D - 3
Q3	C - 1
Q4	B - 3
Q5	C - 1
Q6	C - 1
Q8	C - 2
Q9	D - 3
Q10	B - 3
Q11	A - 2
Q12	D - 1
Q14	C - 2
RV1	B - 4
RV2	A - 3
RV3	C - 4
RV4	C - 3
RV5	C - 4
RV6	C - 3
RV7	C - 3
RV8	C - 4
RV9	C - 1
RV10	A - 1
RV11	A - 2
RV12	A - 1
RV13	C - 2
T1	D - 4
TP1	A - 4
TP2	A - 4
TP3	B - 3
TP4	C - 2
TP5	C - 3
TP6	C - 2
TP7	A - 1
TP8	B - 1
TP9	A - 3
TP10	D - 1
TP11	C - 3
TP12	C - 3
TP13	D - 1
TP14	B - 1
TP16	C - 1
X1	D - 4

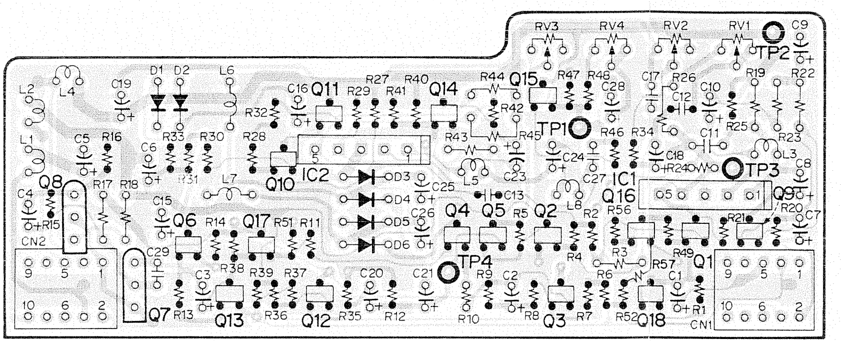


CR-26 -SOLDERING SIDE-
1-615-974-13
BVU-150P

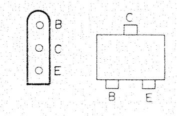


VA-29 (Y/C MIX, VIDEO OUTPUT)

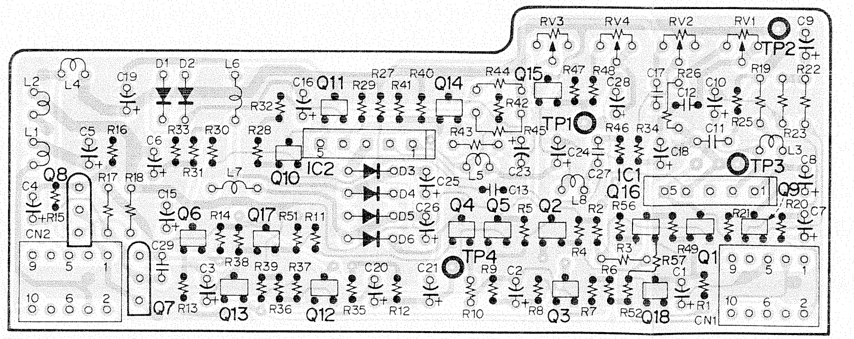
S/N; UP TO 10020



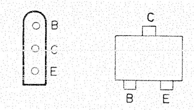
VA-29 -SOLDERING SIDE-
1-615-973-11
BVU-150P



S/N; 10021 to 10190

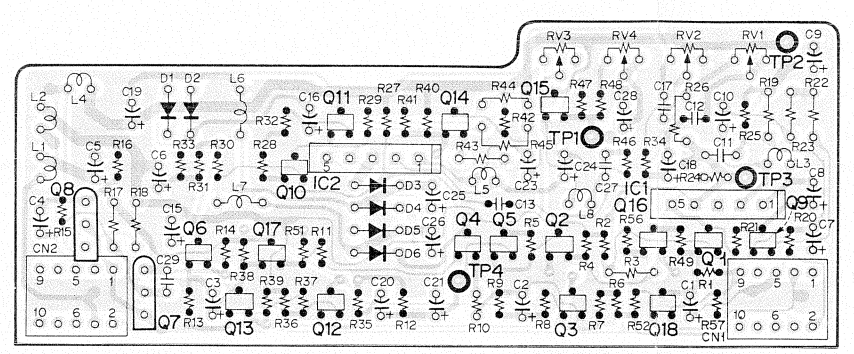


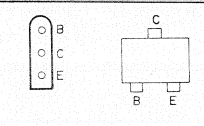
VA-29 -SOLDERING SIDE-
1-615-973-12
BVU-150P



VA-29 (Y/C MIX, VIDEO OUTPUT)

S/N; 10191 and higher



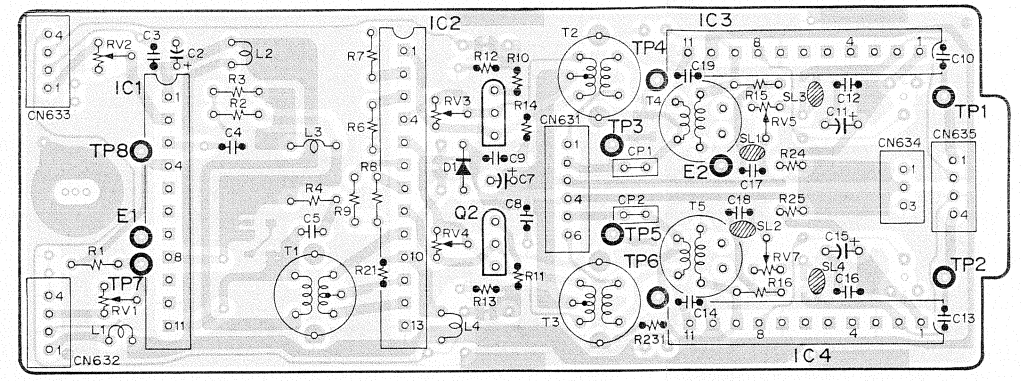


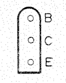
VA-29 -SOLDERING SIDE-

1-615-973-13
BVU-150P

RP-24 (VIDEO REC/PB AMPLIFIER)

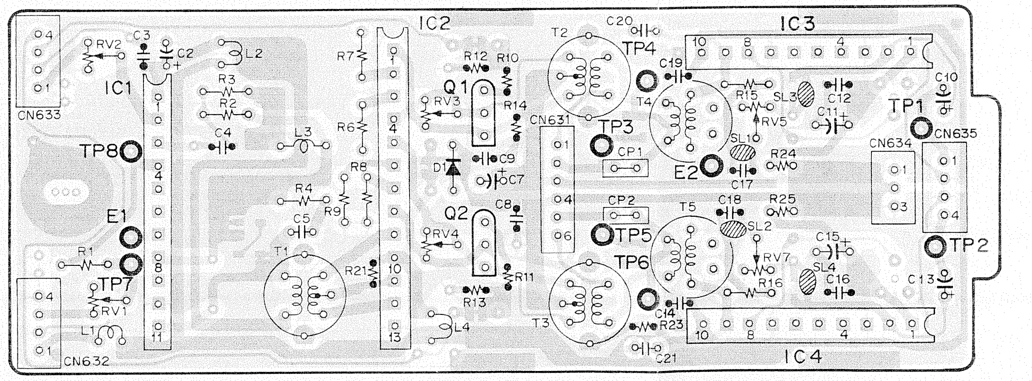
S/N; UP TO 10120

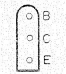




RP-24-SOLDERING SIDE-
1-615-970-11
BVU-150P

S/N; 10121 and higher

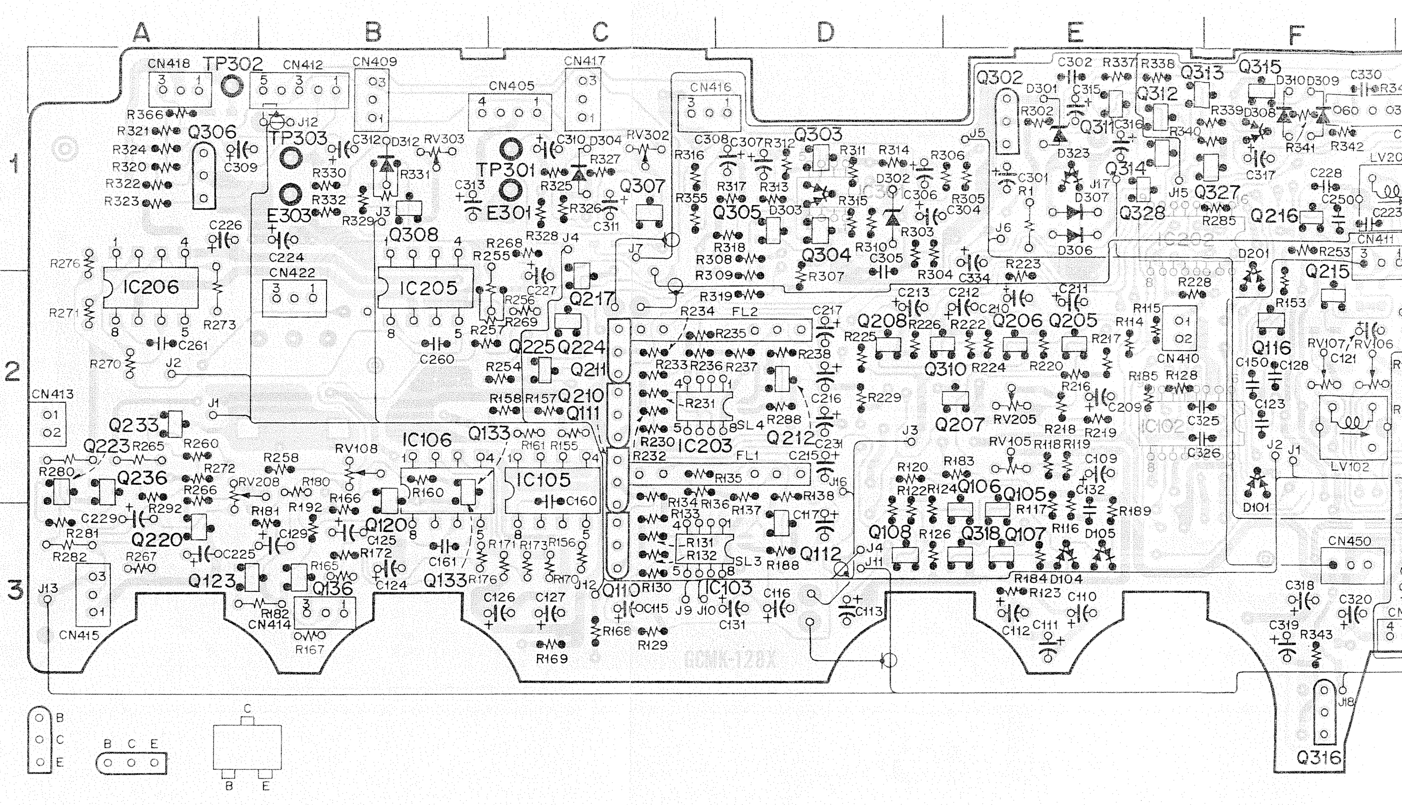


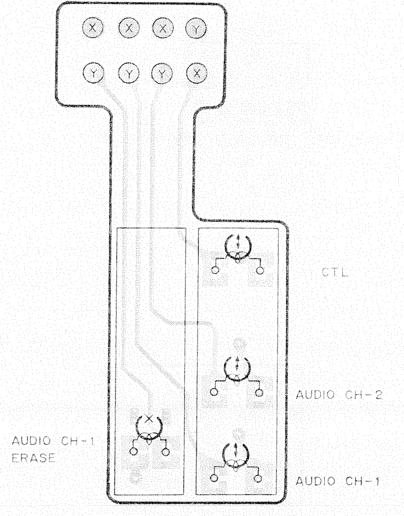


RP-24-SOLDERING SIDE-
1-615-970-12
BVU-150P ----------RP-24
BVU-150 -----------RP-24A

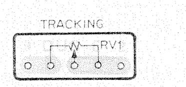
CN401	H - 1
CN404	I - 1
CN405	C - 1
CN406	F - 1
CN407	G - 3
CN408	G - 3
CN409	B - 1
CN410	E - 2
CN411	F - 1
CN412	B - 1
CN413	A - 2
CN414	B - 3
CN415	A - 3
CN416	C - 1
CN417	C - 1
CN418	A - 1
CN419	I - 2
CN420	I - 2
CN422	B - 2
CN450	F - 3
CN451	H - 3
CN452	H - 1
D101	F - 2
D104	E - 3
D105	E - 3
D201	F - 2
D301	E - 1
D302	D - 1
D303	D - 1
D304	C - 1
D306	E - 1
D307	E - 1
D308	F - 1
D309	F - 1
D310	F - 1
D312	B - 1
D320	G - 1
D323	E - 1
E1	H - 1
E301	C - 1
E303	B - 1
FL1	D - 2
FL2	D - 2
IC101	H - 2
IC102	E - 2
IC103	C - 3
IC104	G - 2
IC105	C - 2
IC106	B - 2
IC202	E - 1
IC203	C - 2
IC204	G - 2
IC205	B - 2
IC206	A - 2
IC301	D - 1
LV101	H - 3
LV102	F - 2
LV103	I - 1
LV201	G - 1
LV202	H - 1
LV203	G - 1
LV204	F - 1
Q101	I - 1
Q102	I - 1
Q103	H - 1
Q104	H - 2
Q105	E - 3
Q106	E - 3
Q107	E - 3
Q108	D - 3
Q110	C - 3
Q111	C - 2
Q112	D - 3
Q113	G - 2
Q114	G - 2
Q115	G - 3
Q116	F - 2
Q120	B - 2
Q123	A - 3
Q133	B - 2
Q136	B - 3
Q201	H - 1
Q202	H - 1
Q203	H - 1
Q204	H - 2
Q205	E - 2
Q206	E - 2
Q207	E - 2
Q208	D - 2
Q210	C - 2
Q211	C - 2
Q212	D - 2
Q213	G - 2
Q214	G - 2
Q215	F - 2
Q216	F - 1
Q217	C - 2
Q220	A - 3
Q223	A - 2
Q224	C - 2
Q225	C - 2
Q233	A - 2
Q236	A - 2
Q301	I - 2
Q302	E - 1
Q303	D - 1
Q304	D - 1
Q305	D - 1
Q306	A - 1
Q307	C - 1
Q308	B - 1
Q309	H - 2
Q310	D - 2
Q311	E - 1
Q312	E - 1
Q313	E - 1
Q314	E - 1
Q315	F - 1
Q316	F - 3
Q317	G - 3
Q318	E - 3
Q325	I - 1
Q326	G - 1
Q327	F - 1
Q328	E - 1
Q330	I - 2
RV102	I - 2
RV103	I - 2
RV104	I - 2
RV105	E - 2
RV106	F - 2
RV107	F - 2
RV108	B - 2
RV201	H - 2
RV202	H - 2
RV203	H - 1
RV204	G - 1
RV205	E - 2
RV206	G - 2
RV207	G - 1
RV208	A - 2
RV302	C - 1
RV303	B - 1
TP101	I - 3
TP102	H - 1
TP103	I - 2
TP201	G - 1
TP202	H - 1
TP203	H - 2
TP301	C - 1
TP302	A - 1
TP303	B - 1

AU-49A (AUDIO REC/PB AMPLIFIER)
DU-58 (AUDIO R/P/ERASE, CTL HEAD)
DUS-6 (TRACKING VR)
DUS-69

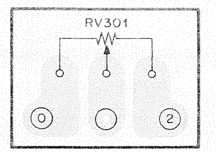




DU-58 -SOLDERING SIDE-
1-611-954-11,12
BVU-150P
BVU-150



DUS-6
-SOLDERING SIDE-
1-611-965-11,12
BVU-150P
BVU-150

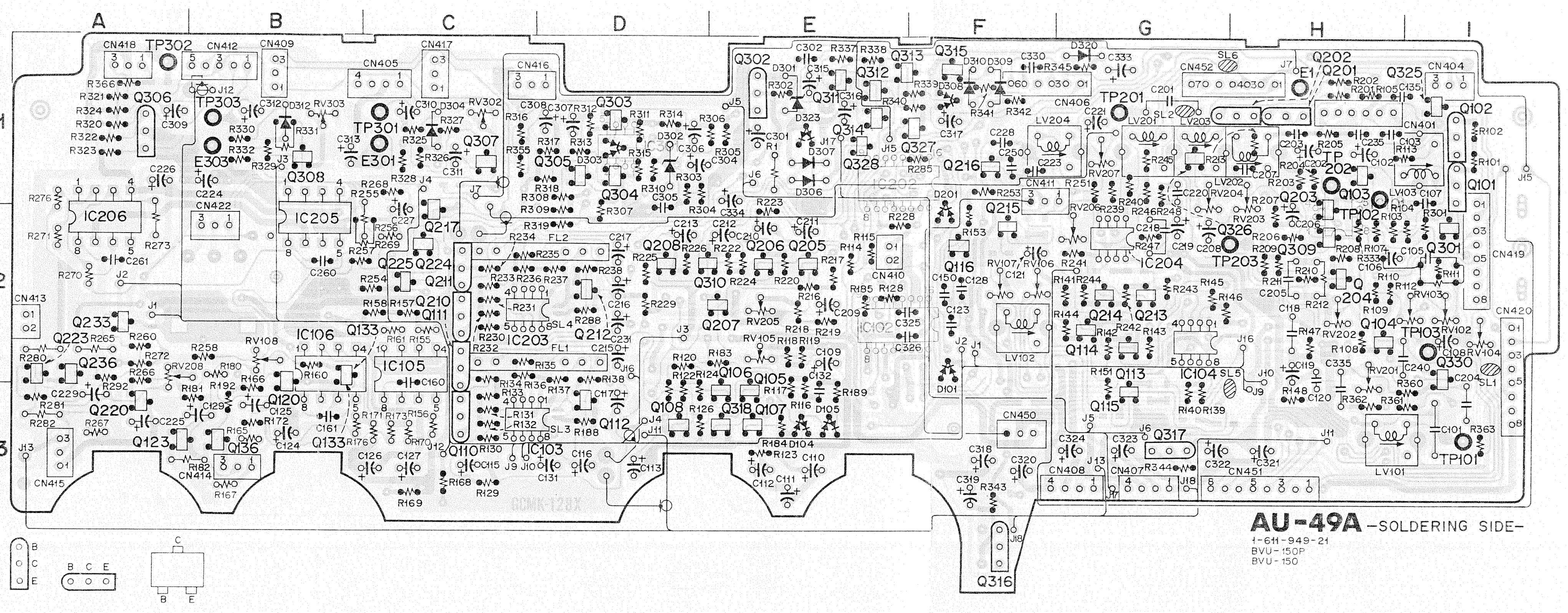


DUS-69
-SOLDERING SIDE-
1-615-689-11
BVU-150P
BVU-150

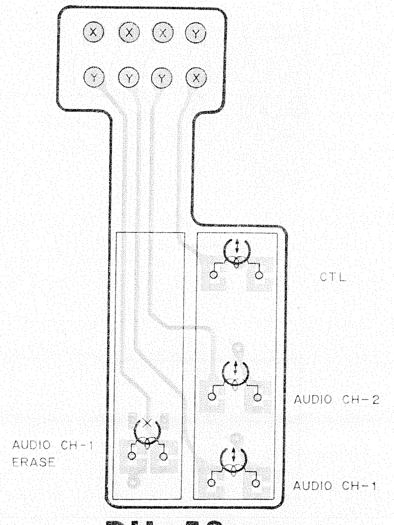
AU-49A (AUDIO REC/PB AMPLIFIER)
DU-58 (AUDIO R/P/ERASE, CTL HEAD)
DUS-6 (TRACKING VR)
DUS-69

C - 1
B - 1

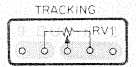
I - 3
H - 1
I - 2
G - 1
H - 1
H - 2
C - 1
A - 1
B - 1



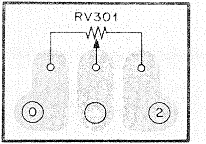
AU-49A -SOLDERING SIDE-
1-611-949-21
BVU-150P
BVU-150



DU-58 -SOLDERING SIDE-
1-611-954-11,12
BVU-150P
BVU-150



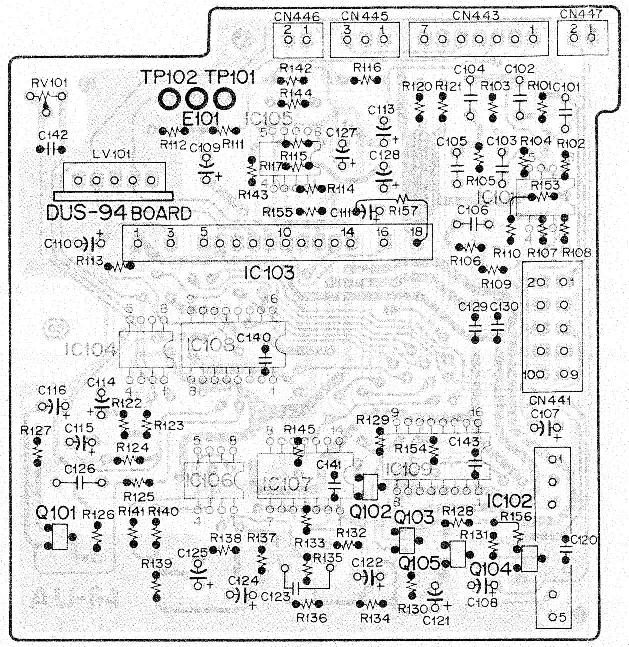
DUS-6
-SOLDERING SIDE-
1-611-965-11,12
BVU-150P
BVU-150



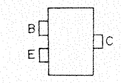
DUS-69
-SOLDERING SIDE-
1-615-689-11
BVU-150P
BVU-150

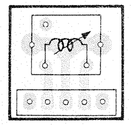
AU-64 (AUDIO CH-1 DOLBY)
AU-65 (AUDIO CH-2 DOLBY)
DUS-94 (VAR, INDUCTOR)

S/N; UP TO 10020

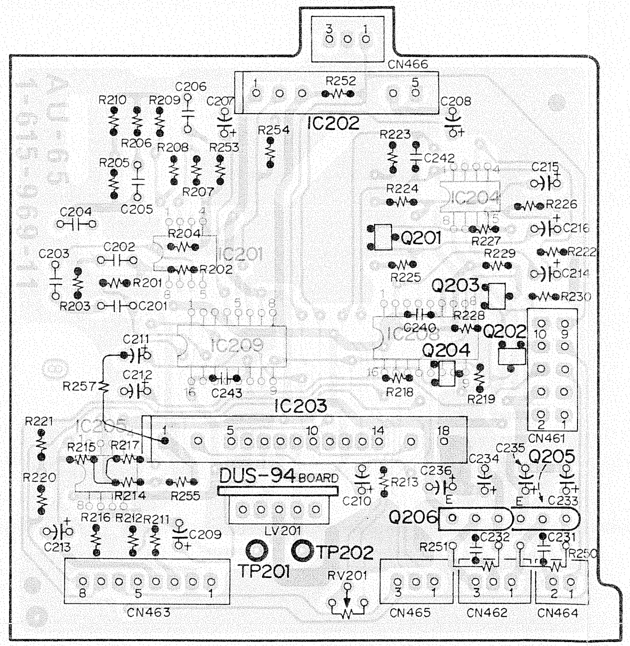


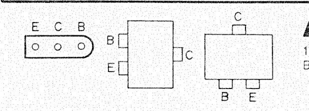
AU-64 -SOLDERING SIDE-
1-615-968-11
BVU-150P



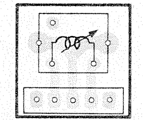


DUS-94
-SOLDERING SIDE-
1-615-980-11
BVU-150P





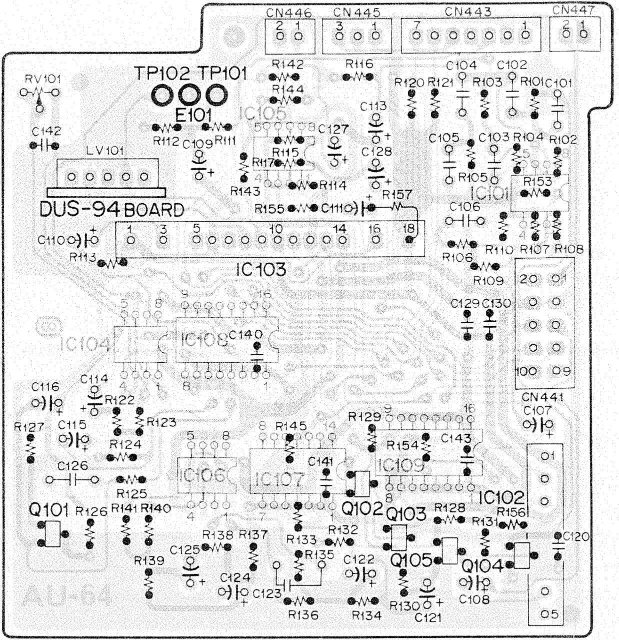
AU-65 -SOLDERING SIDE-
1-615-969-11
BVU-150P

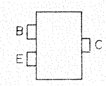


DUS-94
-SOLDERING SIDE-
1-615-980-11
BVU-150P

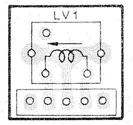
AU-64　(AUDIO CH-1 DOLBY)
AU-65　(AUDIO CH-2 DOLBY)
DUS-94　(VAR, INDUCTOR)

S/N; 10021 to 10190

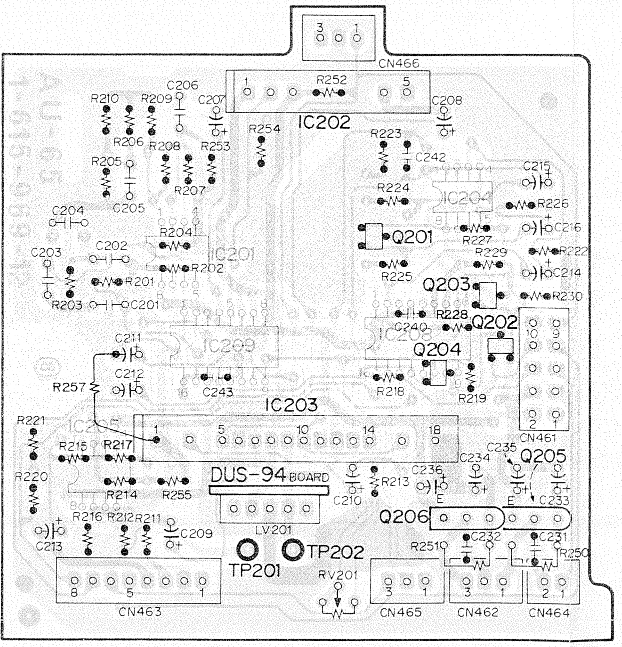


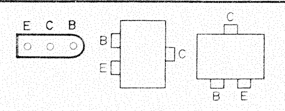


AU-64 -SOLDERING SIDE-
1-615-968-12
BVU-150P ---- AU-64
BVU-150 ----- AU-64A

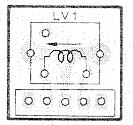


DUS-94
-SOLDERING SIDE-
1-615-980-12
BVU-150P
BVU-150





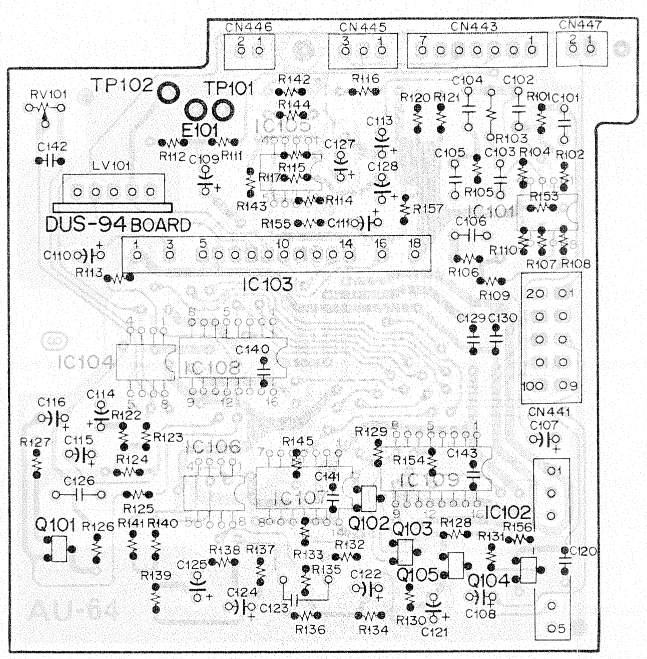
AU-65 -SOLDERING SIDE-
1-615-969-12
BVU-150P ---- AU-65
BVU-150 ----- AU-65A

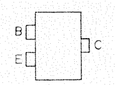


DUS-94
-SOLDERING SIDE-
1-615-980-12
BVU-150P
BVU-150

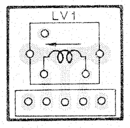
AU-64 (AUDIO CH-1 DOLBY)
AU-65 (AUDIO CH-2 DOLBY)
DUS-94 (VAR, INDUCTOR)

S/N; 10191 and higher

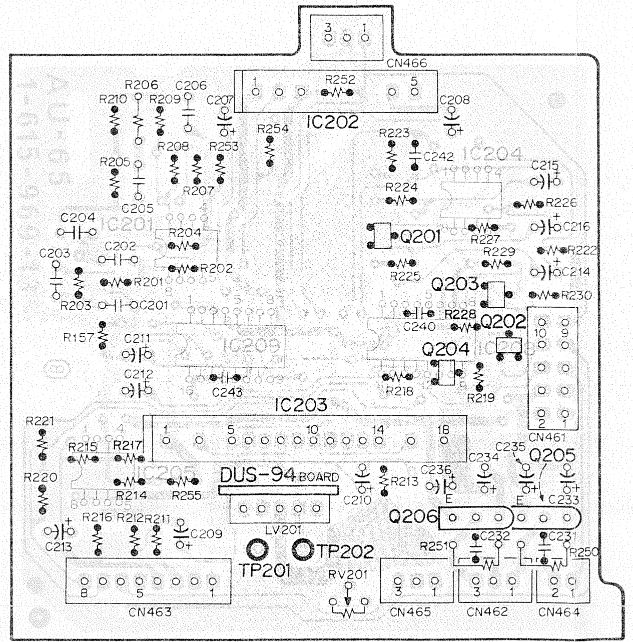


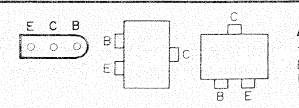


AU-64 -SOLDERING SIDE-
1-615-968-13
BVU-150P ---- AU-64
BVU-150 ----- AU-64A

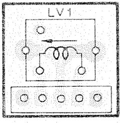


DUS-94
-SOLDERING SIDE-
1-615-980-12
BVU-150P
BVU-150



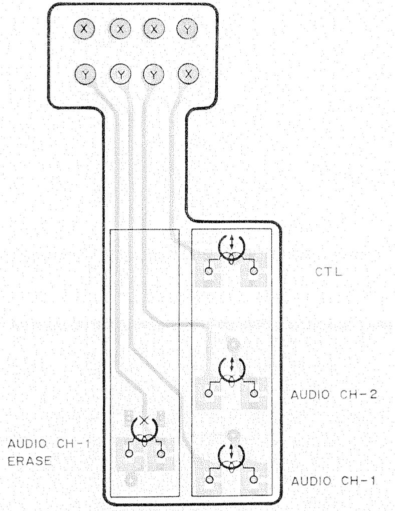


AU-65 -SOLDERING SIDE-
1-615-969-13
BVU-150P ---- AU-65
BVU-150 ----- AU-65A

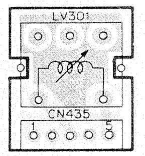


DUS-94
-SOLDERING SIDE-
1-615-980-12
BVU-150P
BVU-150

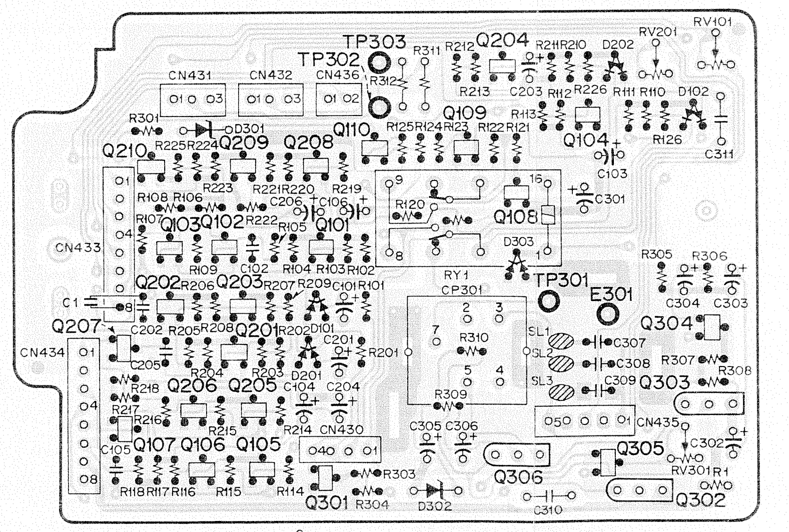
AU-51A (BIAS/ERASE OSC, REC/PB CONTROL)
DU-58 (AUDIO R/P/ERASE, CTL HEAD)
DUS-3 (VAR, INDUCTOR)

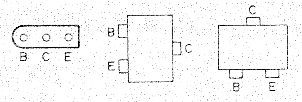


DU-58 -SOLDERING SIDE-
1-611-954-11,12
BVU-150P
BVU-150



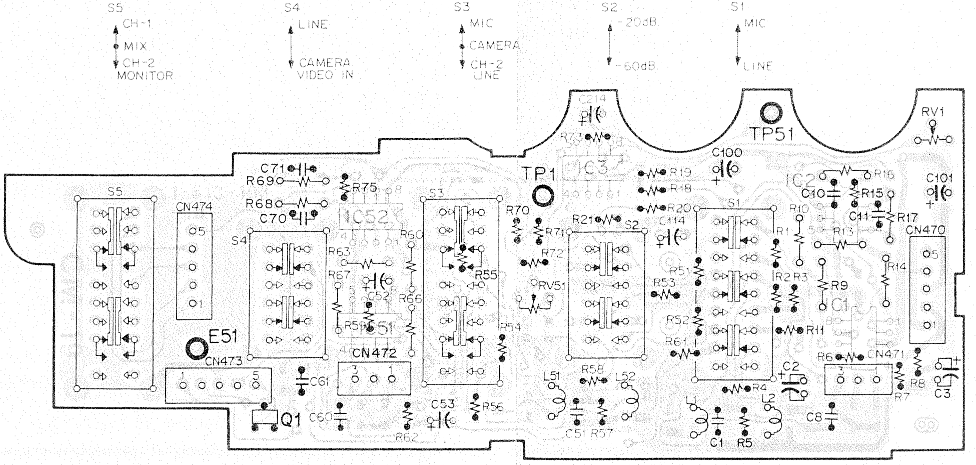
DUS-3
-SOLDERING SIDE-
1-611-961-11
BVU-150P
BVU-150



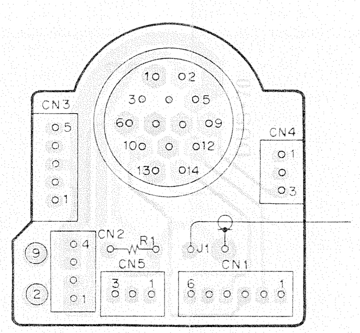


AU-51A -SOLDERING SIDE-
1-611-950-21
BVU-150P
BVU-150

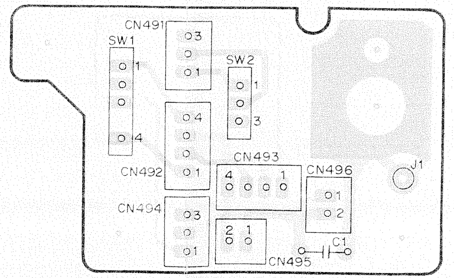
CM-19A (CAMERA/MIC INPUT SELECT)
DUS-70 (CAMERA INPUT)
SWB-4 (AUDIO LEVEL/METER SELECT)



CM-19A -SOLDERING SIDE-
1-613-103-15
BVU-150P
BVU-150



DUS-70 -SOLDERING SIDE-
1-615-977-11
BVU-150P
BVU-150



SWB-4 -SOLDERING SIDE-
1-615-967-11
BVU-150P
BVU-150

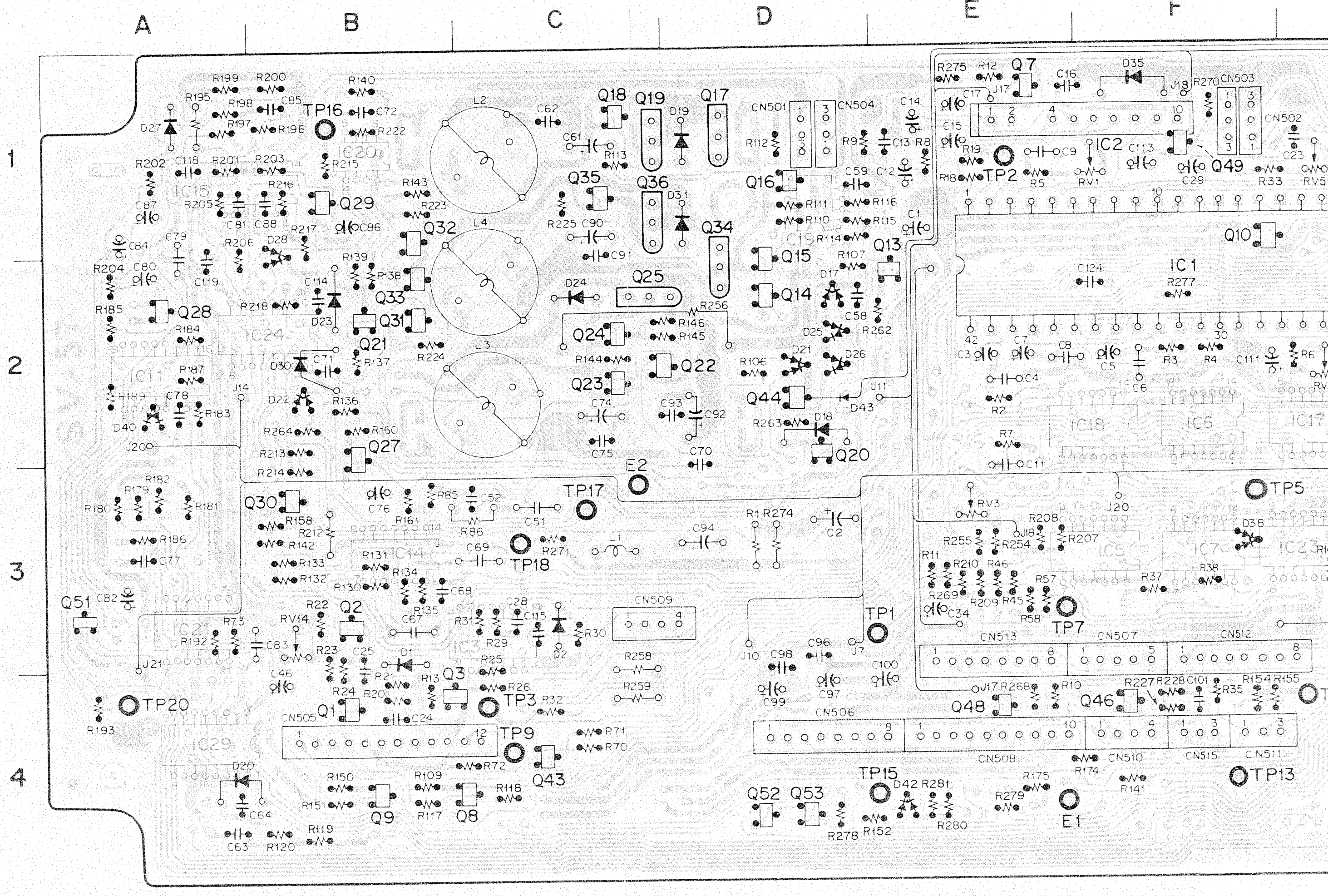
SV-57C (DRUM/CAPSTAN/REEL SERVO)
PC-22 (S/T-REEL FG GEN.)

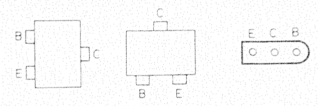
S/N: UP TO 10020

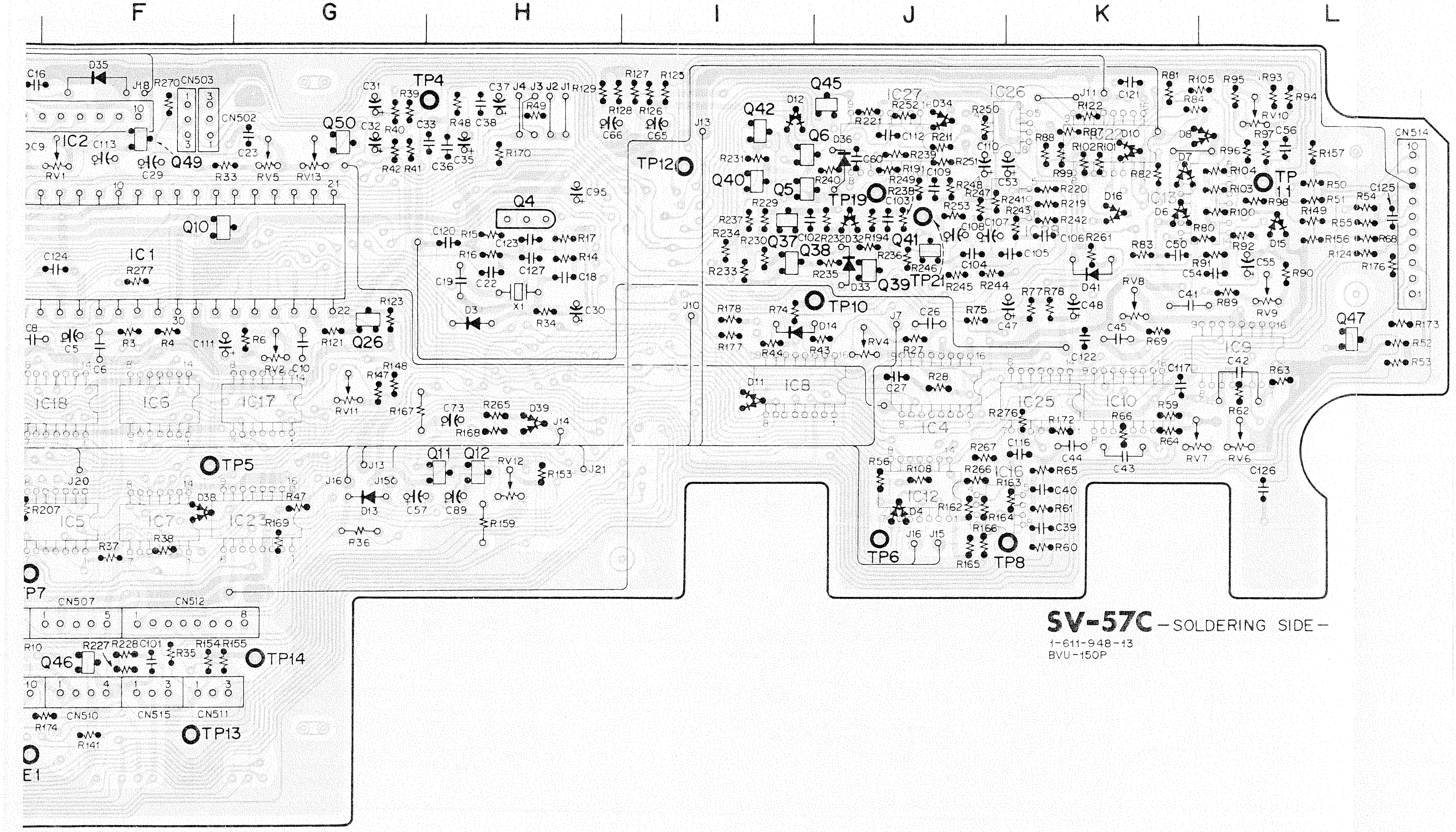
Ref. No.	Type	Pin No.				
		+12V	+10.5V	+5V	GND	−5V
IC 1	CX194B			*	11, 29	
IC 2	BX3915A			*	2, 8	
IC 3	TC4011BF			14	7	
IC 4	TC4538BF			16	8	
IC 5	TC4011BF			14	7	
IC 6	TC4011BF			14	7	
IC 7	TC4069UBF			14	7	
IC 8	TC4050BF			1	8	
IC 9	TC4538BF			16	8	
IC 10	TC4538BF			16	8	
IC 11	TC4538BF			16	8	
IC 12	TC4069UBF			14	7	
IC 13	μPC324G2		4			11
IC 14	μPC324G2		4			11
IC 15	μPC324G2		4			11
IC 16	μPC393G2		8		4	
IC 17	TC4069UBF			14	7	
IC 18	TC4001BF			14	7	
IC 19	μPC393G2	8			4	
IC 20	μPC393G2	8			4	
IC 21	TC4030BF			14	7	
IC 22	TC4053BF			16	8	7
IC 23	TC4053BF			16	8	7
IC 24	TC4053BF			16	8	7
IC 25	TC4013BF			14	7	
IC 26	μPC393G2		8		4	
IC 27	TC4053BF		16		7, 8	
IC 28	μPC4558G2		8		4	
IC 29	TC4538BF			16	8	

*REFER TO SCHEMATIC

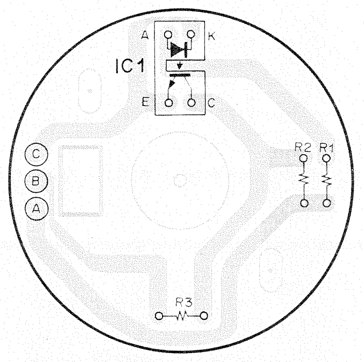
CN501	D - 1
CN502	F - 1
CN503	F - 1
CN504	D - 1
CN505	B - 4
CN506	D - 4
CN507	F - 3
CN508	E - 4
CN509	C - 3
CN510	F - 4
CN511	F - 4
CN512	F - 3
CN513	E - 3
CN514	L - 1
CN515	F - 4
D1	B - 3
D2	C - 3
D3	H - 2
D4	J - 3
D6	K - 1
D7	K - 1
D8	L - 1
D10	K - 1
D11	I - 2
D12	I - 1
D13	G - 3
D14	I - 2
D15	L - 1
D16	K - 1
D17	D - 2
D18	D - 2
D19	D - 1
D20	A - 4
D21	D - 2
D22	B - 2
D23	B - 2
D24	C - 2
D25	D - 2
D26	D - 2
D27	A - 1
D28	B - 1
D30	B - 2
D31	D - 1
D32	J - 1
D33	J - 2
D34	J - 1
D35	F - 1
D36	J - 1
D38	F - 3
D39	H - 2
D40	A - 2
D41	K - 2
D42	E - 4
E1	E - 4
E2	C - 3
IC1	F - 2
IC2	E - 1
IC3	C - 3
IC4	J - 2
IC5	F - 3
IC6	F - 2
IC7	F - 3
IC8	I - 2
IC9	L - 2
IC10	K - 2
IC11	A - 2
IC12	J - 3
IC13	L - 1
IC14	B - 3
IC15	B - 1
IC16	J - 3
IC17	G - 2
IC18	F - 2
IC19	D - 1
IC20	B - 1
IC21	A - 3
IC22	K - 1
IC23	G - 3
IC24	B - 2
IC25	K - 2
IC26	K - 1
IC27	J - 1
IC28	K - 1
IC29	A - 4
Q1	B - 4
Q2	B - 3
Q3	B - 4
Q4	H - 1
Q5	I - 1
Q6	I - 1
Q7	E - 1
Q8	C - 4
Q9	B - 4
Q10	F - 1
Q11	H - 3
Q12	H - 3
Q13	E - 2
Q14	D - 2
Q15	D - 2
Q16	D - 1
Q17	D - 1
Q18	C - 1
Q19	C - 1
Q20	D - 2
Q21	B - 2
Q22	D - 2
Q23	C - 2
Q24	C - 2
Q25	C - 2
Q26	G - 2
Q27	B - 2
Q28	A - 2
Q29	B - 1
Q30	B - 3
Q31	B - 2
Q32	B - 1
Q33	B - 2
Q34	D - 2
Q35	C - 1
Q36	C - 1
Q37	I - 1
Q38	I - 2
Q39	J - 2
Q40	I - 1
Q41	J - 2
Q42	I - 1
Q43	C - 4
Q44	D - 2
Q45	J - 1
Q46	F - 4
Q47	L - 2
Q48	E - 4
Q49	F - 1
Q50	G - 1
Q51	A - 3
Q52	D - 4
Q53	D - 4
RV1	F - 1
RV2	G - 2
RV3	E - 3
RV4	J - 2
RV5	G - 1
RV6	L - 3
RV7	K - 3
RV8	K - 2
RV9	L - 2
RV10	L - 1
RV11	G - 2
RV12	H - 3
RV13	G - 1
RV14	B - 3
TP1	E - 3
TP2	E - 1
TP3	C - 4
TP4	H - 1
TP5	F - 3
TP6	J - 3
TP7	E - 3
TP8	K - 3
TP9	C - 4
TP10	J - 2
TP11	L - 1
TP12	I - 1
TP13	F - 4
TP14	G - 4
TP15	E - 4
TP16	B - 1
TP17	C - 3
TP18	C - 3
TP19	J - 1
TP20	A - 4
TP21	J - 1
X1	H - 2







SV-57C – SOLDERING SIDE –
1-611-948-13
BVU-150P



PC-22 – SOLDERING SIDE –
1-611-960-12
BVU-150P

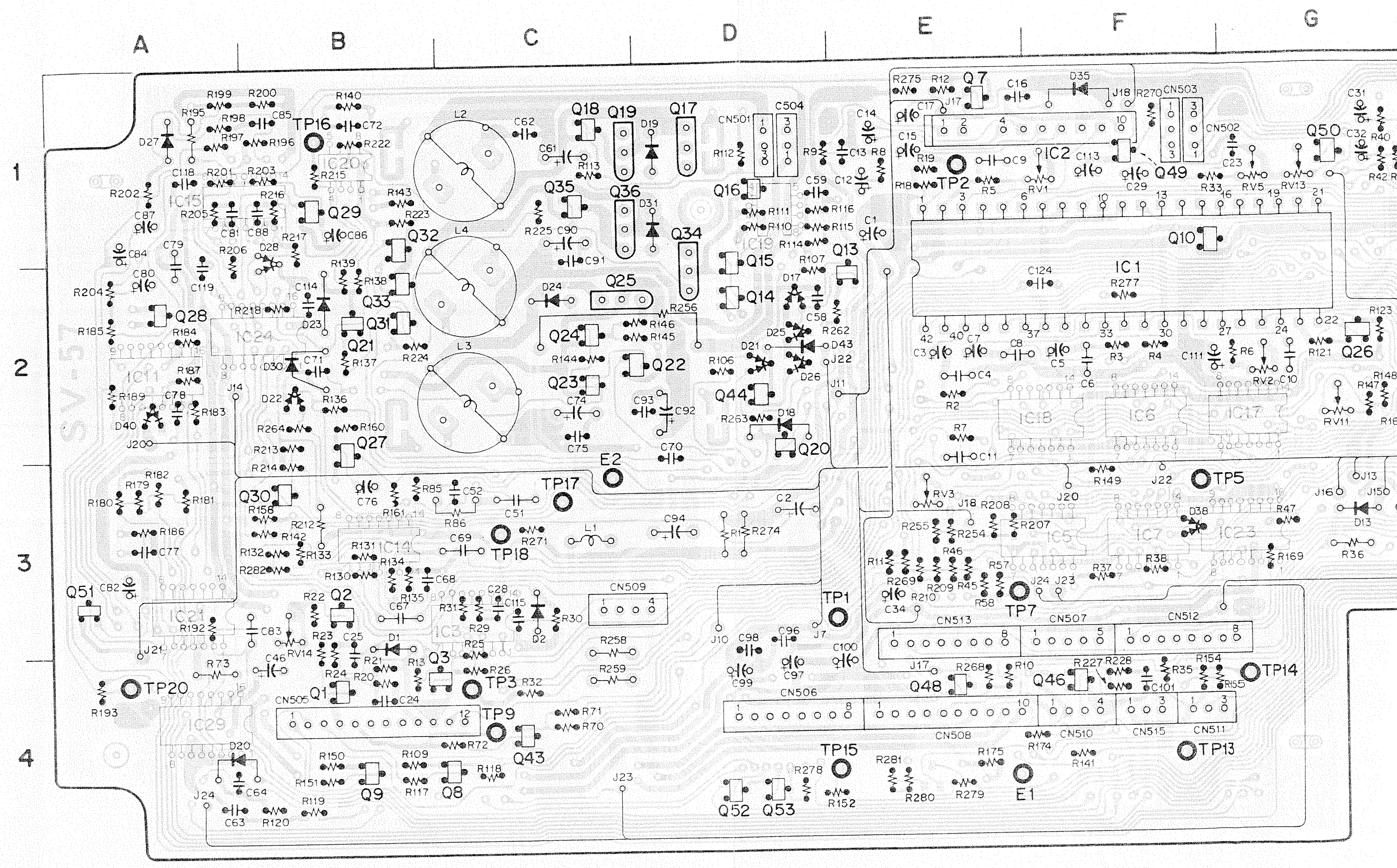
Ref. No.	Type	Pin No.				
		+12V	+10.5V	+5V	GND	−5V
IC 1	CX194B			*	11, 29	
IC 2	BX3915A			*	2, 8	
IC 3	TC4011BF			14	7	
IC 4	TC4538BF			16	8	
IC 5	TC4011BF			14	7	
IC 6	TC4011BF			14	7	
IC 7	TC4069UBF			14	7	
IC 8	TC4050BF			1	8	
IC 9	TC4538BF			16	8	
IC 10	TC4538BF			16	8	
IC 11	TC4538BF			16	8	
IC 12	TC4069UBF			14	7	
IC 13	μPC324G2		4			11
IC 14	μPC324G2		4			11
IC 15	μPC324G2		4			11
IC 16	μPC393G2		8		4	
IC 17	TC4069UBF			14	7	
IC 18	TC4001BF			14	7	
IC 19	μPC393G2	8			4	
IC 20	μPC393G2	8			4	
IC 21	TC4030BF			14	7	
IC 22	TC4053BF			16	8	7
IC 23	TC4053BF			16	8	7
IC 24	TC4053BF			16	8	7
IC 25	TC4013BF			14	7	
IC 26	μPC393G2		8		4	
IC 27	TC4053BF		16		7, 8	
IC 28	μPC4558G2		8		4	
IC 29	TC4538BF			16	8	

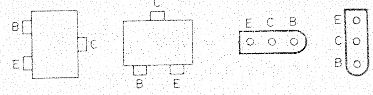
*REFER TO SCHEMATIC

CN501	D - 1
CN502	F - 1
CN503	F - 1
CN504	D - 1
CN505	B - 4
CN506	D - 4
CN507	F - 3
CN508	E - 4
CN509	C - 3
CN510	F - 4
CN511	F - 4
CN512	F - 3
CN513	E - 3
CN514	L - 1
CN515	F - 4
D1	B - 3
D2	C - 3
D3	H - 2
D4	J - 3
D6	K - 1
D7	K - 1
D8	L - 1
D10	K - 1
D11	I - 2
D12	I - 1
D13	G - 3
D14	I - 2
D15	L - 1
D16	K - 1
D17	D - 2
D18	D - 2
D19	D - 1
D20	A - 4
D21	D - 2
D22	B - 2
D23	B - 2
D24	C - 2
D25	D - 2
D26	D - 2
D27	A - 1
D28	B - 1
D30	B - 2
D31	D - 1
D32	J - 1
D33	J - 2
D34	J - 1
D35	F - 1
D36	J - 1
D38	F - 3
D39	H - 2
D40	A - 2
D41	K - 2
D43	D - 2
D44	J - 1
E1	E - 4
E2	C - 3
IC1	F - 2
IC2	E - 1
IC3	C - 3
IC4	J - 2
IC5	F - 3
IC6	F - 2
IC7	F - 3
IC8	I - 2
IC9	L - 2
IC10	K - 2
IC11	A - 2
IC12	J - 3
IC13	K - 1
IC14	B - 3
IC15	A - 1
IC16	J - 3
IC17	G - 2
IC18	F - 2
IC19	D - 1
IC20	B - 1
IC21	A - 3
IC22	K - 1
IC23	G - 3
IC24	B - 2
IC25	K - 2
IC26	K - 1
IC27	J - 1
IC28	K - 1
IC29	A - 4
Q1	B - 4
Q2	B - 3
Q3	B - 4
Q4	H - 1
Q5	I - 1
Q6	I - 1
Q7	E - 1
Q8	C - 4
Q9	B - 4
Q10	F - 1
Q11	H - 3
Q12	H - 3
Q13	E - 2
Q14	D - 2
Q15	D - 2
Q16	D - 1
Q17	D - 1
Q18	C - 1
Q19	C - 1
Q20	D - 2
Q21	B - 2
Q22	D - 2
Q23	C - 2
Q24	C - 2
Q25	C - 2
Q26	G - 2
Q27	B - 2
Q28	A - 2
Q29	B - 1
Q30	B - 3
Q31	B - 2
Q32	B - 1
Q33	B - 2
Q34	D - 2
Q35	C - 1
Q36	C - 1
Q37	I - 1
Q38	I - 2
Q39	J - 2
Q40	I - 1
Q41	J - 2
Q42	I - 1
Q43	C - 4
Q44	D - 2
Q45	J - 1
Q46	F - 4
Q47	L - 2
Q48	E - 4
Q49	F - 1
Q50	G - 1
Q51	A - 3
Q52	D - 4
Q53	D - 4
Q54	E - 4
RV1	F - 1
RV2	G - 2
RV3	E - 3
RV4	J - 2
RV5	G - 1
RV6	L - 3
RV7	K - 3
RV8	K - 2
RV9	L - 2
RV10	L - 1
RV11	G - 2
RV12	H - 3
RV13	G - 1
RV14	B - 3
TP1	E - 3
TP2	E - 1
TP3	C - 4
TP4	H - 1
TP5	F - 3
TP6	J - 3
TP7	E - 3
TP8	K - 3
TP9	C - 4
TP10	J - 2
TP11	L - 1
TP12	I - 1
TP13	F - 4
TP14	G - 4
TP15	E - 4
TP16	B - 1
TP17	C - 3
TP18	C - 3
TP19	J - 1
TP20	A - 4
TP21	J - 1
X1	H - 2

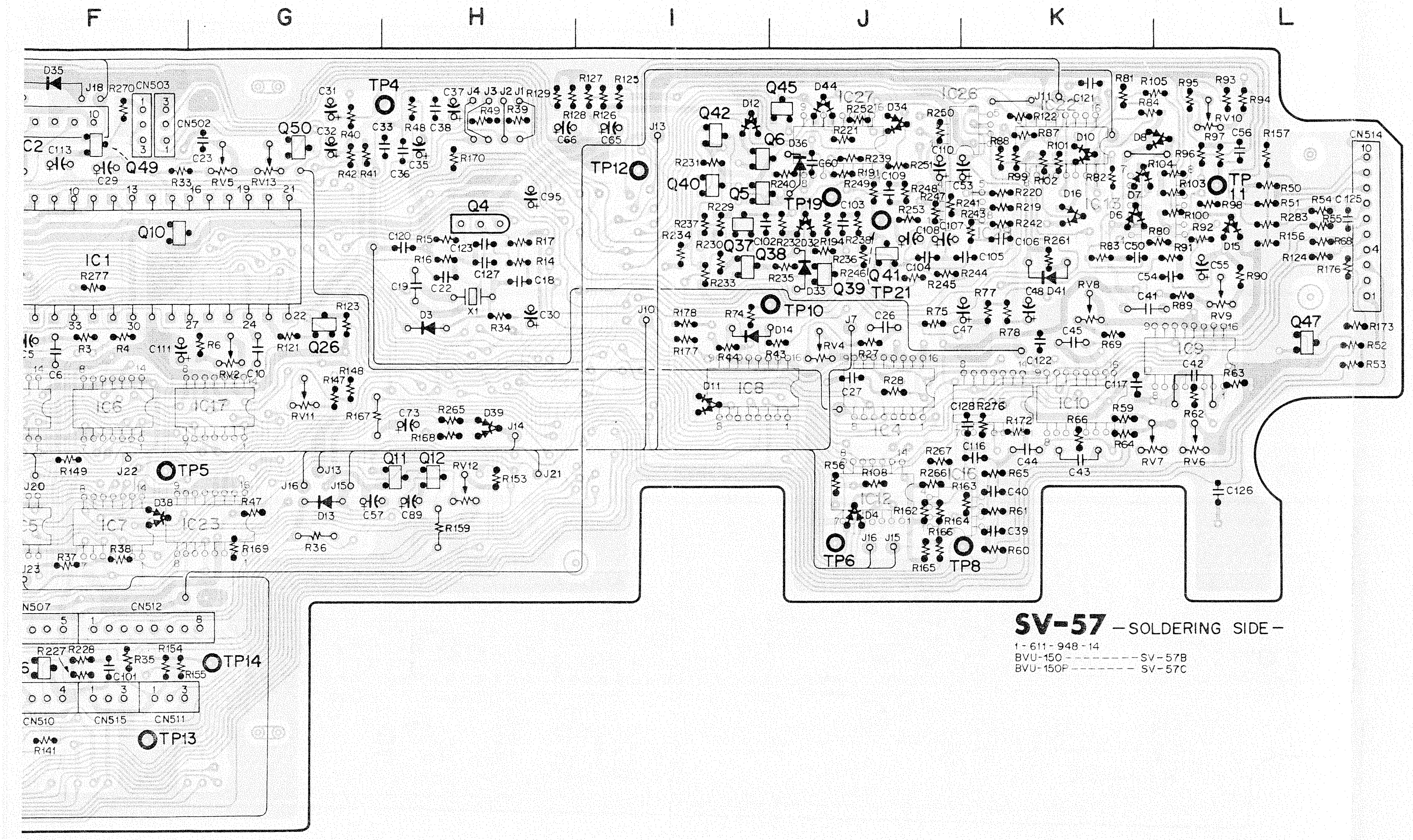
SV-57C (DRUM/CAPSTAN/REEL SERVO)
PC-22 (S/T-REEL FG GEN.)

S/N; 10021 and higher



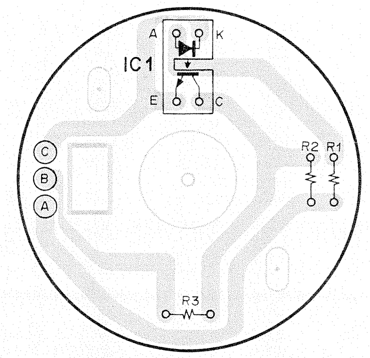


REF. NO.	NTSC	PAL/SEC
J1	SHORT	OPEN
J2	OPEN	SHORT
J3	SHORT	SHORT
J4	OPEN	OPEN



SV-57 —SOLDERING SIDE—

1-611-948-14
BVU-150 ---------SV-57B
BVU-150P --------- SV-57C



PC-22—SOLDERING SIDE—

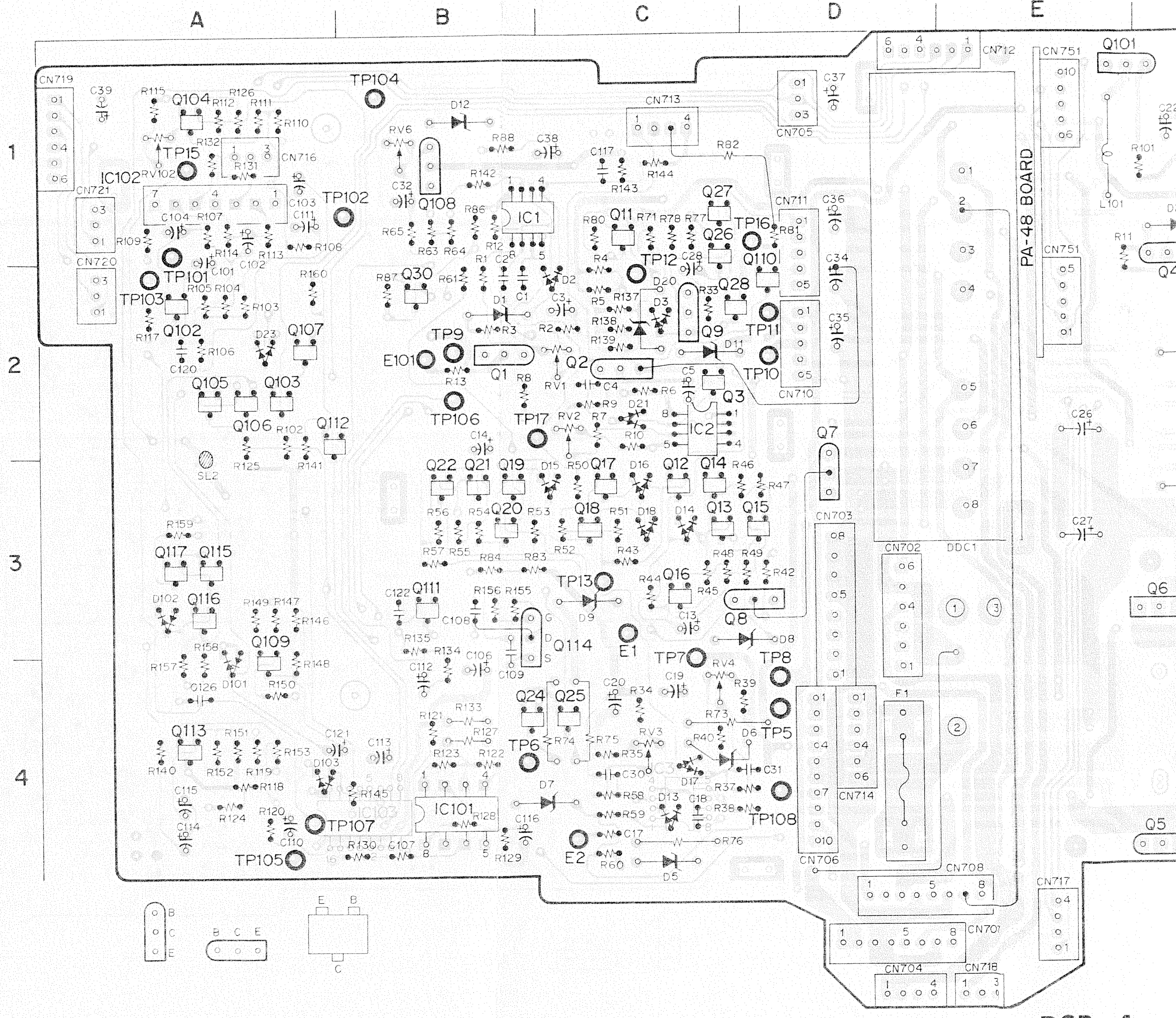
1-611-960-12
BVU-150P
BVU-150

REF. NO.	NTSC	PAL/SEC
J1	SHORT	OPEN
J2	OPEN	SHORT
J3	SHORT	SHORT
J4	OPEN	OPEN

PSB-4 (POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26 (DC IN CONNECTOR)
CN-100 (BACK UP CAPACITOR)
TM-19 (HOURS METER)

S/N; UP TO 10020

CN702	D - 3	F1	D - 4	Q115	A - 3
CN703	D - 3			Q116	A - 3
CN704	D - 4	IC1	B - 1	Q117	A - 3
CN705	D - 1	IC2	C - 2		
CN706	D - 4	IC3	C - 4	RV1	C - 2
CN707	D - 4	IC101	B - 4	RV2	C - 2
CN708	D - 4	IC102	A - 1	RV3	C - 4
CN710	D - 2	IC103	B - 4	RV4	C - 4
CN711	D - 1			RV6	B - 1
CN712	E - 1	Q1	B - 2	RV102	A - 1
CN713	C - 1	Q2	C - 2		
CN714	D - 4	Q3	C - 2	TP5	D - 4
CN716	A - 1	Q4	F - 1	TP6	B - 4
CN717	E - 4	Q5	F - 4	TP7	C - 4
CN718	E - 4	Q6	F - 3	TP8	D - 4
CN719	A - 1	Q7	D - 3	TP9	B - 2
CN720	A - 2	Q8	D - 3	TP10	D - 2
CN721	A - 1	Q9	C - 2	TP11	D - 2
CN751	E - 1	Q11	C - 1	TP12	C - 2
		Q12	C - 3	TP13	C - 3
D1	B - 2	Q13	C - 3	TP15	A - 1
D2	C - 2	Q14	C - 3	TP16	D - 1
D3	C - 2	Q15	D - 3	TP17	B - 2
D5	C - 4	Q16	C - 3	TP101	A - 1
D6	C - 1	Q17	C - 3	TP102	B - 1
D7	C - 4	Q18	C - 3	TP103	A - 2
D8	D - 3	Q19	B - 3	TP104	B - 1
D9	C - 3	Q20	B - 3	TP105	A - 4
D11	C - 2	Q21	B - 3	TP106	B - 2
D12	B - 1	Q22	B - 3	TP107	A - 4
D13	C - 4	Q24	B - 4	TP108	D - 4
D14	C - 3	Q25	C - 4		
D15	C - 3	Q26	C - 1		
D16	C - 3	Q27	C - 1		
D17	C - 4	Q28	C - 2		
D18	C - 3	Q30	B - 2		
D20	C - 2	Q101	E - 1		
D21	C - 2	Q102	A - 2		
D22	F - 1	Q103	A - 2		
D23	A - 2	Q104	A - 1		
D101	A - 4	Q105	A - 2		
D102	A - 3	Q106	A - 2		
D103	A - 4	Q107	A - 2		
		Q108	B - 1		
DDC-1	E - 2	Q109	A - 4		
		Q110	D - 2		
E1	C - 3	Q111	B - 3		
E2	C - 4	Q112	A - 2		
E101	B - 2	Q113	A - 4		
		Q114	B - 3		



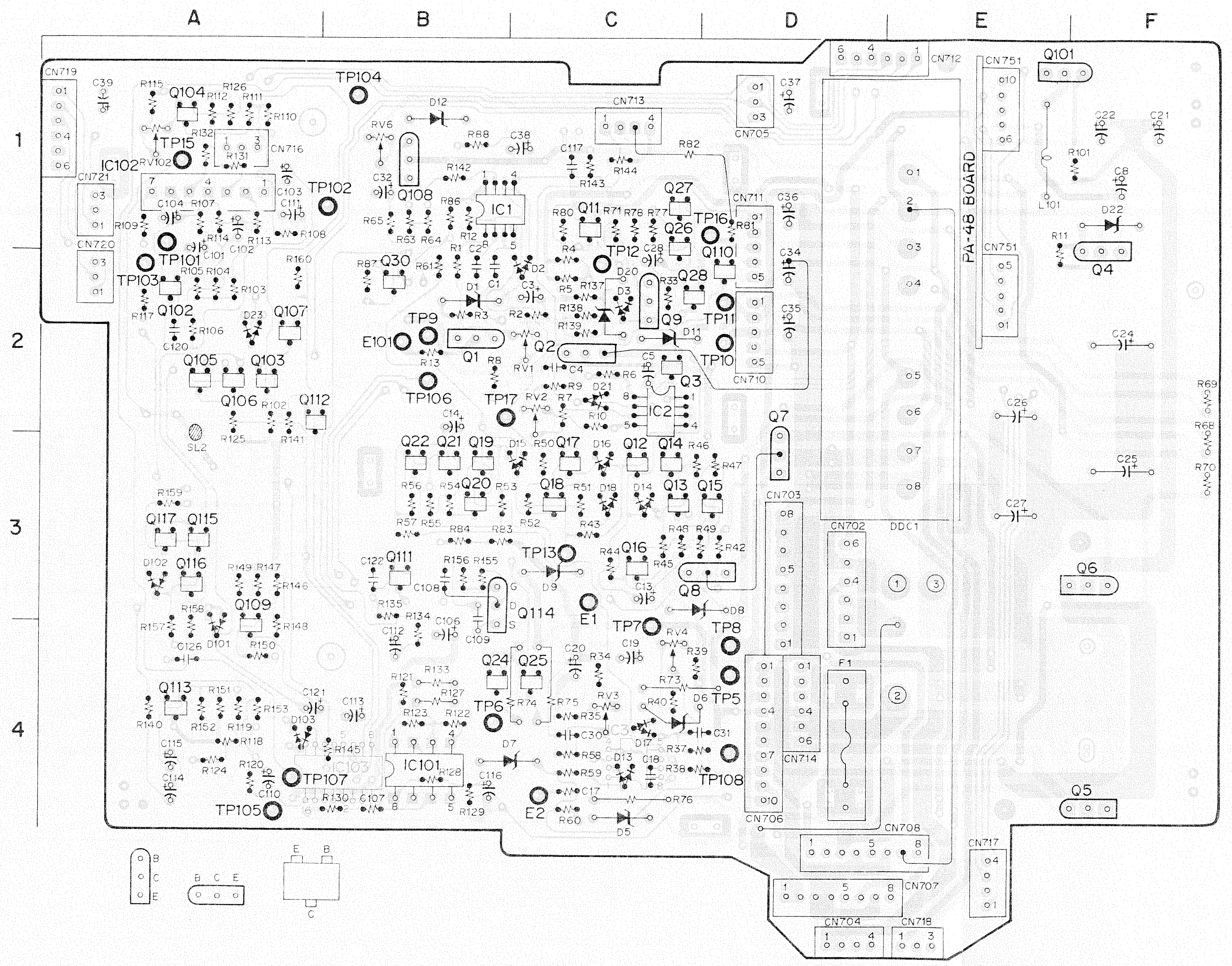
PSB-4 - SO

1-615-965-11
BVU-150P

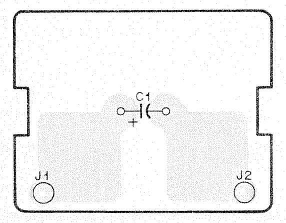
PSB-4	(POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26	(DC IN CONNECTOR)
CN-100	(BACK UP CAPACITOR)
TM-19	(HOURS METER)

S/N; UP TO 10020

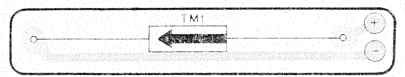
15	A - 3
16	A - 3
17	A - 3
1	C - 2
2	C - 2
3	C - 4
4	C - 4
6	B - 1
102	A - 1
5	D - 4
6	B - 4
7	C - 4
8	D - 4
9	B - 2
10	D - 2
11	D - 2
12	C - 2
13	C - 3
15	A - 1
16	D - 1
17	B - 2
101	A - 1
102	B - 1
103	A - 2
104	B - 1
105	A - 4
106	B - 2
107	A - 4
108	D - 4



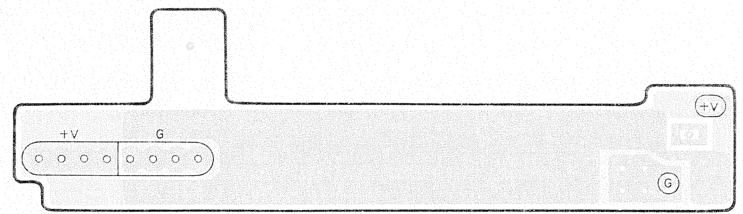
PSB-4 -SOLDERING SIDE-
1-615-965-11
BVU-150P



CN-100 -SOLDERING SIDE-
1-615-979-11
BVU-150P



TM-19 -SOLDERING SIDE-
1-613-881-11
BVU-150P

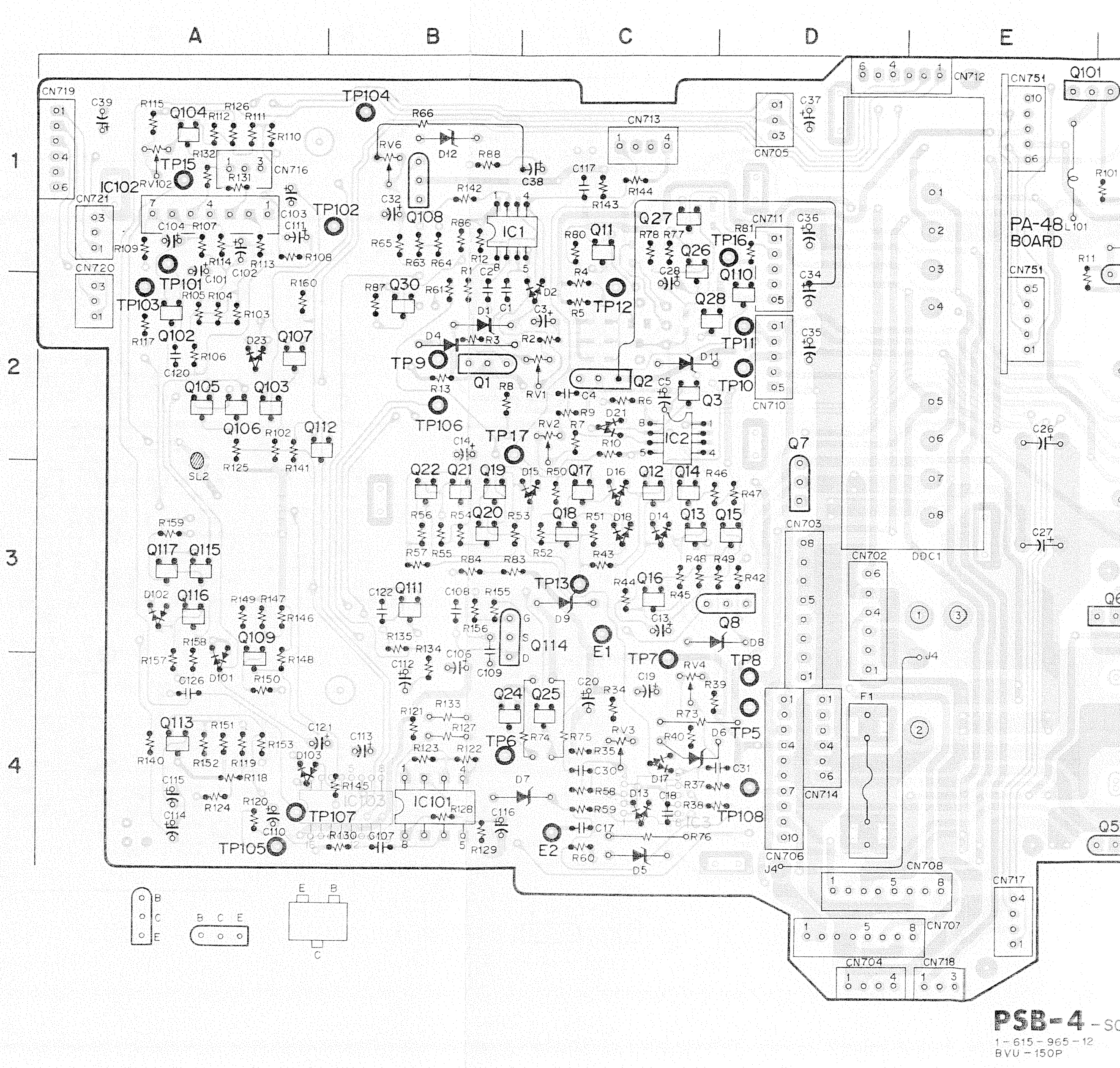


CN-26 -SOLDERING SIDE-
1-615-976-11
BVU-150P

PSB-4 (POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26 (DC IN CONNECTOR)
CN-100 (BACK UP CAPACITOR)
TM-19 (HOURS METER)

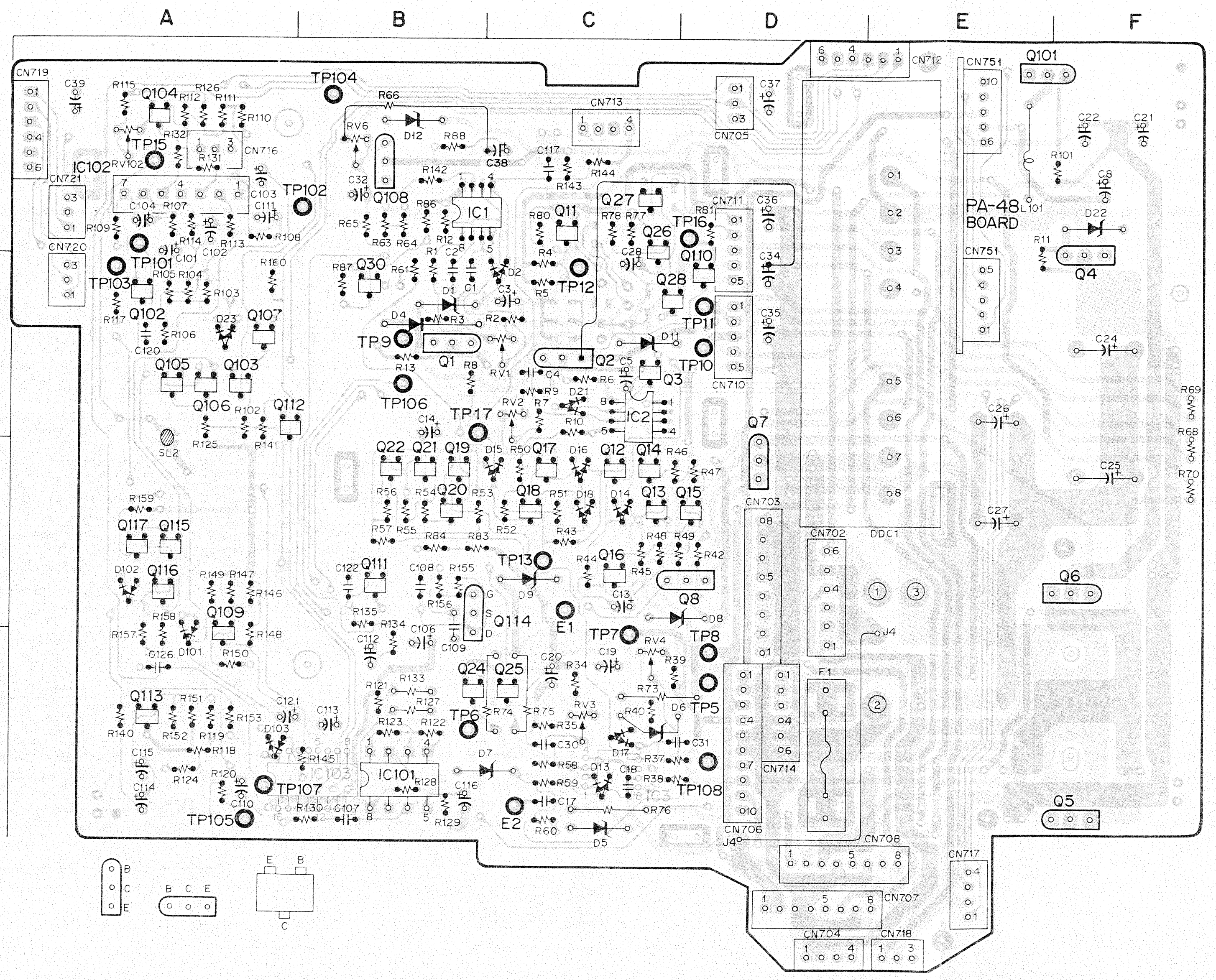
S/N; 10021 to 10120

CN702	D - 3
CN703	D - 3
CN704	D - 4
CN705	D - 1
CN706	D - 4
CN707	D - 4
CN708	D - 4
CN710	D - 2
CN711	D - 1
CN712	E - 1
CN713	C - 1
CN714	D - 4
CN716	A - 1
CN717	E - 4
CN718	E - 4
CN719	A - 1
CN720	A - 2
CN721	A - 1
CN751	E - 1
D1	B - 2
D2	C - 2
D4	B - 2
D5	C - 4
D6	C - 4
D7	C - 4
D8	D - 3
D9	C - 3
D11	C - 2
D12	B - 1
D13	C - 4
D14	C - 3
D15	C - 3
D16	C - 3
D17	C - 4
D18	C - 3
D21	C - 2
D22	F - 1
D23	A - 2
D101	A - 4
D102	A - 3
D103	A - 4
DDC-1	E - 2
E1	C - 3
E2	C - 4
F1	D - 4
IC1	B - 1
IC2	C - 2
IC3	C - 4
IC101	B - 4
IC102	A - 1
IC103	B - 4
Q1	B - 2
Q2	C - 2
Q3	C - 2
Q4	F - 1
Q5	F - 4
Q6	F - 3
Q7	D - 3
Q8	D - 3
Q11	C - 1
Q12	C - 3
Q13	C - 3
Q14	C - 3
Q15	D - 3
Q16	C - 3
Q17	C - 3
Q18	C - 3
Q19	B - 3
Q20	B - 3
Q21	B - 3
Q22	B - 3
Q24	B - 4
Q25	C - 4
Q26	C - 1
Q27	C - 1
Q28	C - 2
Q30	B - 2
Q101	E - 1
Q102	A - 2
Q103	A - 2
Q104	A - 1
Q105	A - 2
Q106	A - 2
Q107	A - 2
Q108	B - 1
Q109	A - 4
Q110	D - 2
Q111	B - 3
Q112	A - 2
Q113	A - 4
Q114	B - 3
Q115	A - 3
Q116	A - 3
Q117	A - 3
RV1	C - 2
RV2	C - 2
RV3	C - 4
RV4	C - 4
RV6	B - 1
RV102	A - 1
TP5	D - 4
TP6	B - 4
TP7	C - 4
TP8	D - 4
TP9	B - 2
TP10	D - 2
TP11	D - 2
TP12	C - 2
TP13	C - 3
TP15	A - 1
TP16	D - 1
TP17	B - 2
TP101	A - 1
TP102	B - 1
TP103	A - 2
TP104	B - 1
TP105	A - 4
TP106	B - 2
TP107	A - 4
TP108	D - 4

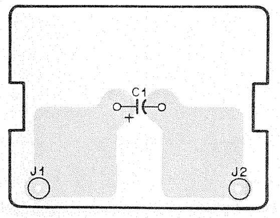


PSB-4 (POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26 (DC IN CONNECTOR)
CN-100 (BACK UP CAPACITOR)
TM-19 (HOURS METER)

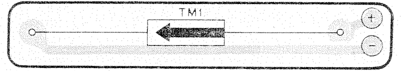
S/N; 10021 to 10120



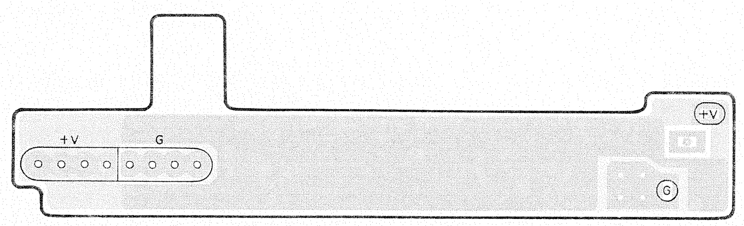
PSB-4 -SOLDERING SIDE-
1-615-965-12
BVU-150P



CN-100 -SOLDERING SIDE-
1-615-979-11
BVU-150P



TM-19 -SOLDERING SIDE-
1-613-881-11
BVU-150P

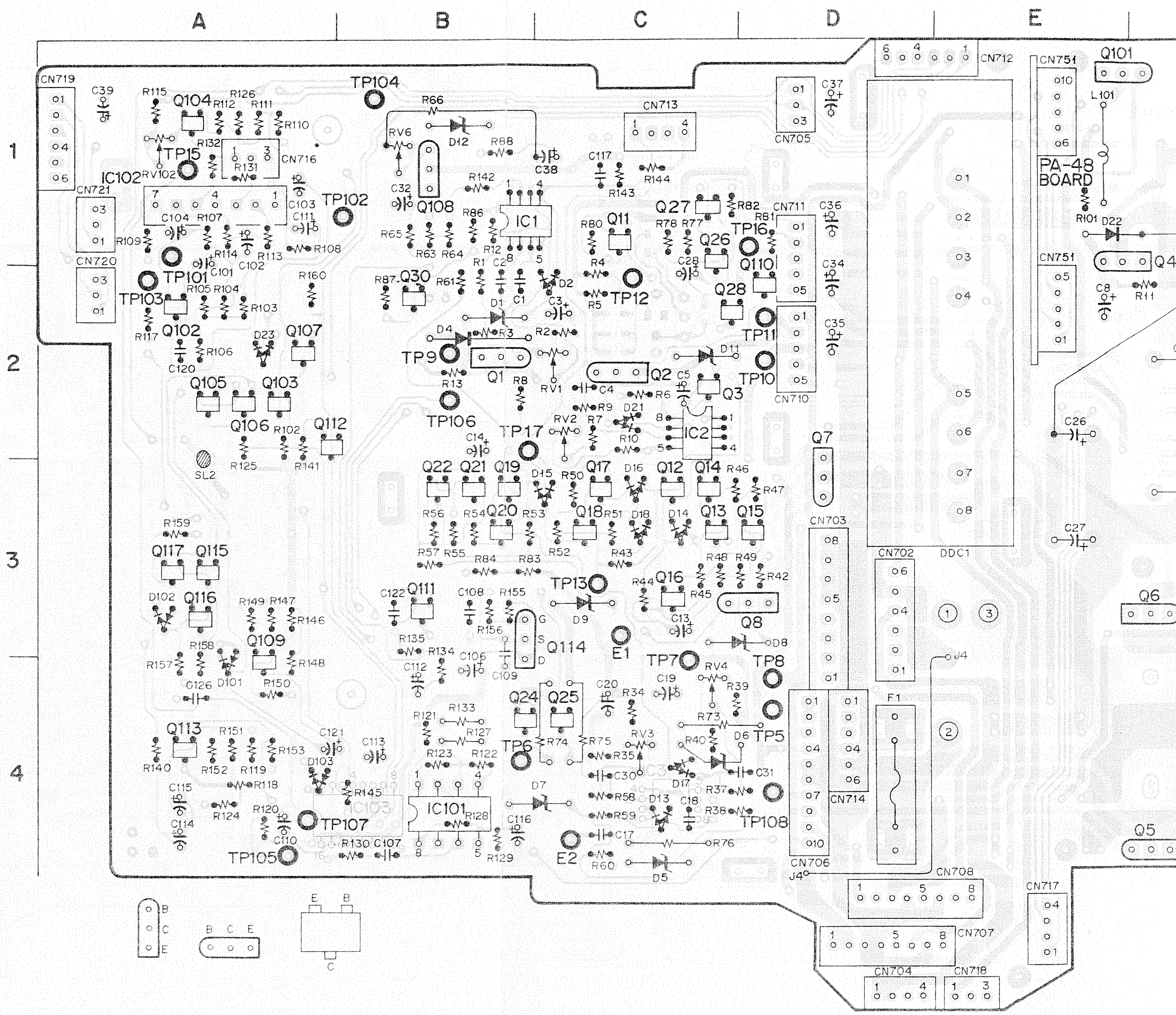


CN-26 -SOLDERING SIDE-
1-615-976-11
BVU-150P

PSB-4　(POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26　(DC IN CONNECTOR)
CN-100　(BACK UP CAPACITOR)
TM-19　(HOURS METER)

S/N; 10121 and higher

CN702	D - 3	IC1	B - 1	RV1	C - 2
CN703	D - 3	IC2	C - 2	RV2	C - 2
CN704	D - 4	IC3	C - 4	RV3	C - 4
CN705	D - 1	IC101	B - 4	RV4	C - 4
CN706	D - 4	IC102	A - 1	RV6	B - 1
CN707	D - 4	IC103	B - 4	RV102	A - 1
CN708	D - 4				
CN710	D - 2	Q1	B - 2	TP5	D - 4
CN711	D - 1	Q2	C - 2	TP6	B - 4
CN712	E - 1	Q3	C - 2	TP7	C - 4
CN713	C - 1	Q4	F - 1	TP8	D - 4
CN714	D - 4	Q5	F - 4	TP9	B - 2
CN716	A - 1	Q6	F - 3	TP10	D - 2
CN717	E - 4	Q7	D - 3	TP11	D - 2
CN718	E - 4	Q8	D - 3	TP12	C - 2
CN719	A - 1	Q11	C - 1	TP13	C - 3
CN720	A - 2	Q12	C - 3	TP15	A - 1
CN721	A - 1	Q13	C - 3	TP16	D - 1
CN751	E - 1	Q14	C - 3	TP17	B - 2
		Q15	D - 3	TP101	A - 1
D1	B - 2	Q16	C - 3	TP102	B - 1
D2	C - 2	Q17	C - 3	TP103	A - 2
D4	B - 2	Q18	C - 3	TP104	B - 1
D5	C - 4	Q19	B - 3	TP105	A - 4
D6	C - 4	Q20	B - 3	TP106	B - 2
D7	C - 4	Q21	B - 3	TP107	A - 4
D8	D - 3	Q22	B - 3	TP108	D - 4
D9	C - 3	Q24	B - 4		
D11	C - 2	Q25	C - 4		
D12	B - 1	Q26	C - 1		
D13	C - 4	Q27	C - 1		
D14	C - 3	Q28	C - 2		
D15	C - 3	Q30	B - 2		
D16	C - 3	Q101	E - 1		
D17	C - 4	Q102	A - 2		
D18	C - 3	Q103	A - 2		
D21	C - 2	Q104	A - 1		
D22	E - 1	Q105	A - 2		
D23	A - 2	Q106	A - 2		
D101	A - 4	Q107	A - 2		
D102	A - 3	Q108	B - 1		
D103	A - 4	Q109	A - 4		
		Q110	D - 2		
DDC - 1	E - 2	Q111	B - 3		
		Q112	A - 2		
E1	C - 3	Q113	A - 4		
E2	C - 4	Q114	B - 3		
		Q115	A - 3		
F1	D - 4	Q116	A - 3		
		Q117	A - 3		



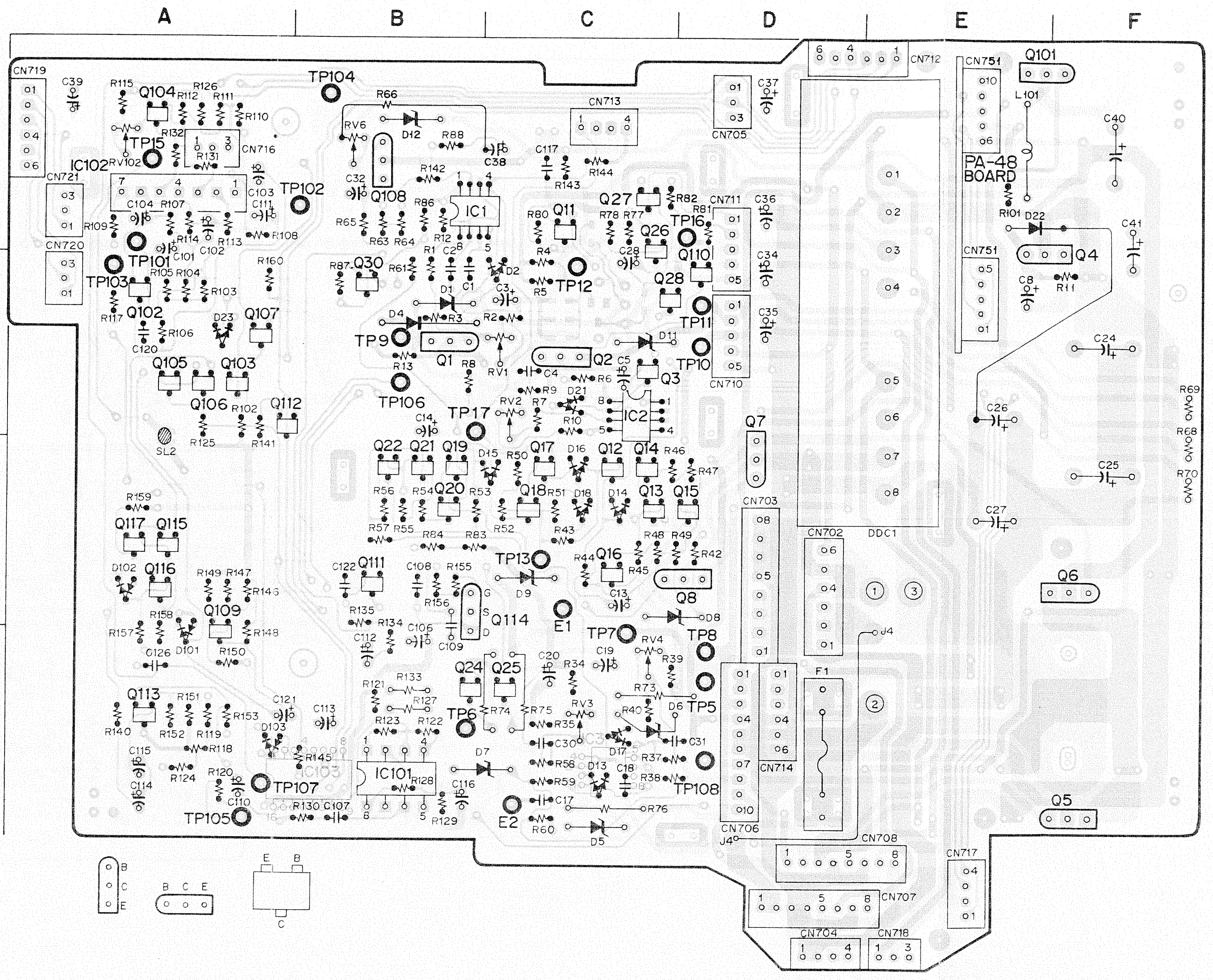
PSB-4 -SOLD
1-615-965-13, 14
BVU-150----PSB-4A
BVU-150P---PSB-4

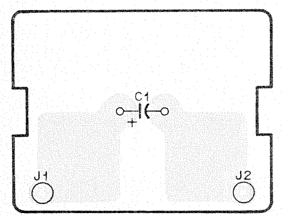
PSB-4 (POWER SUPPLY/TIME CODE REC AMPLIFIER)
CN-26 (DC IN CONNECTOR)
CN-100 (BACK UP CAPACITOR)
TM-19 (HOURS METER)

S/N; 10121 and higher

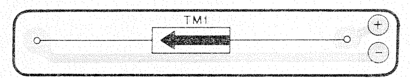
C - 2
C - 2
C - 4
C - 4
B - 1
2 A - 1

D - 4
B - 4
C - 4
D - 4
B - 2
D - 2
D - 2
C - 2
C - 3
A - 1
D - 1
B - 2
1 A - 1
2 B - 1
3 A - 2
4 B - 1
5 A - 4
6 B - 2
7 A - 4
3 D - 4



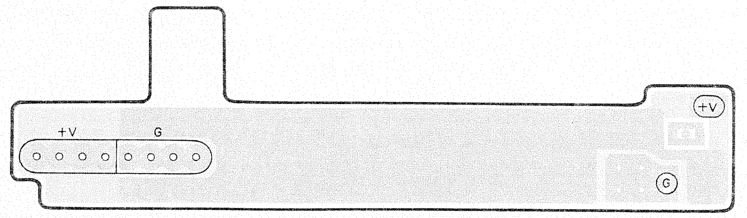


CN-100 -SOLDERING SIDE-
1-615-979-11
BVU-150P
BVU-150



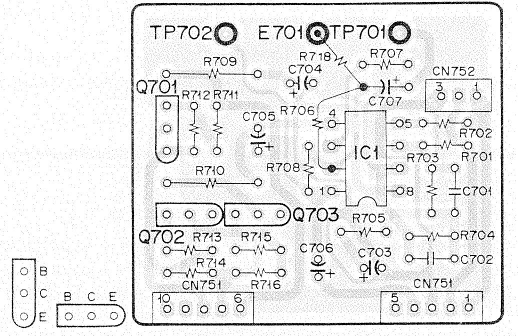
TM-19 -SOLDERING SIDE-
1-613-881-11
BVU-150P
BVU-150

PSB-4 -SOLDERING SIDE-
1-615-965-13, 14
BVU-150---PSB-4A
BVU-150P---PSB-4



CN-26 -SOLDERING SIDE-
1-615-976-11
BVU-150P
BVU-150

PA-48 (TIME CODE PB AMPLIFIER)

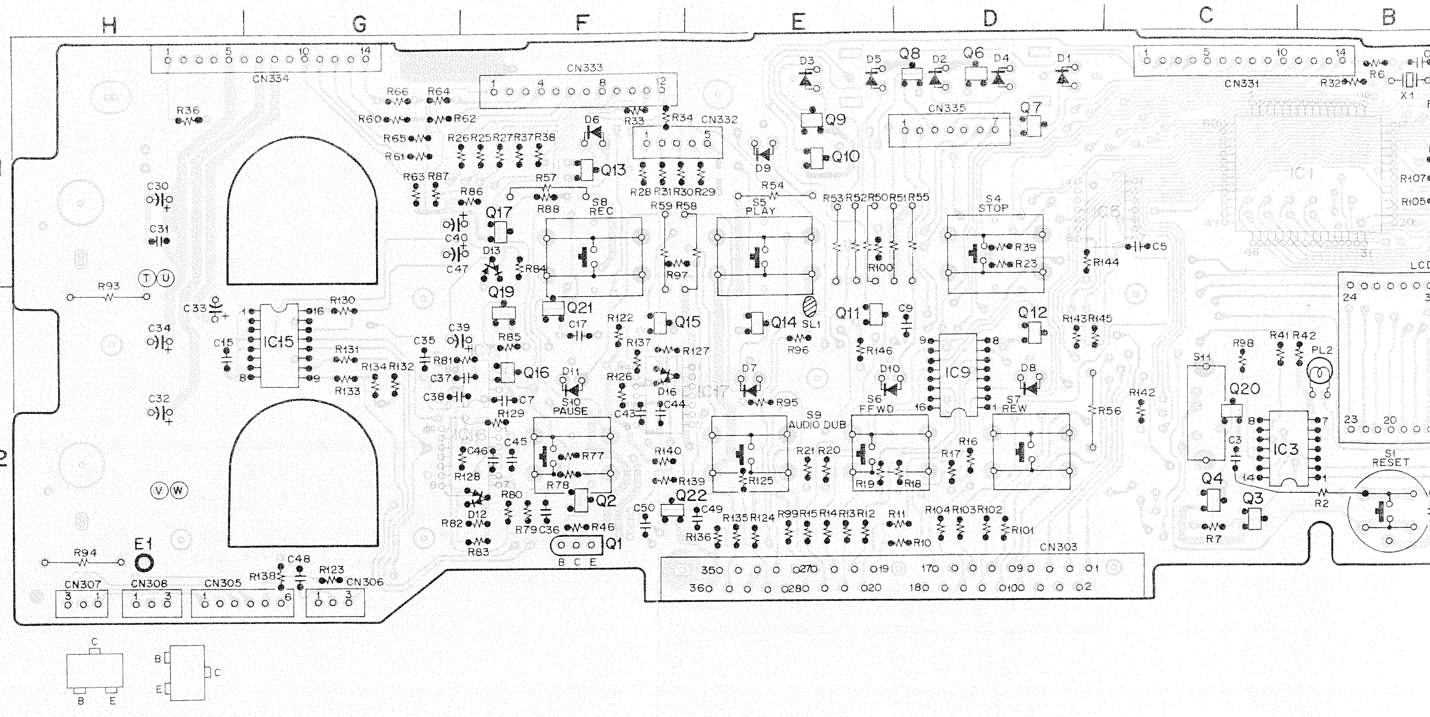


PA-48-SOLDERING SIDE-
1-615-966-11
BVU-150P
BVU-150

KY-86 (FUNCTION KEY/DISPLAY)

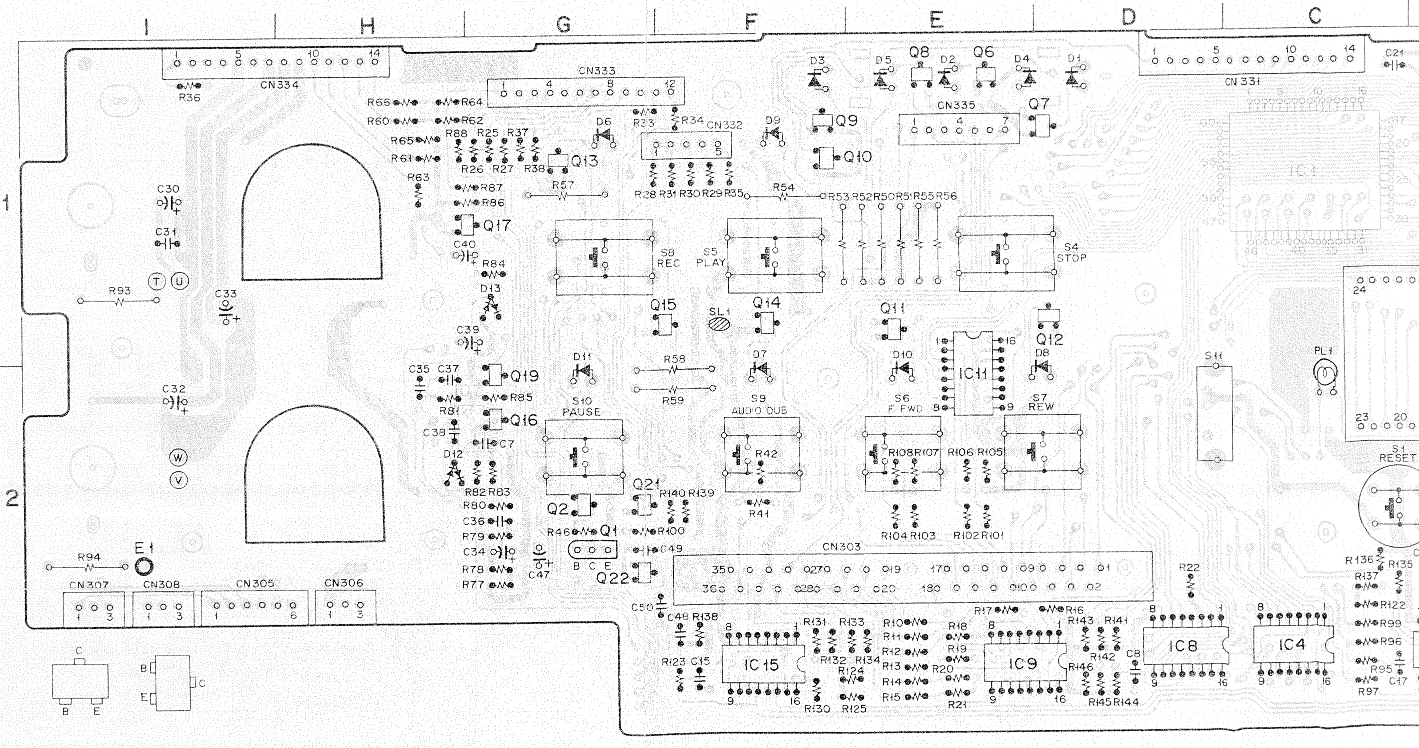
S/N; UP TO 10190

CN303	D - 2
CN305	H - 2
CN306	G - 2
CN307	H - 2
CN308	H - 2
CN331	C - 1
CN332	F - 1
CN333	F - 1
CN334	G - 1
CN335	D - 1
D1	D - 1
D2	D - 1
D3	E - 1
D4	D - 1
D5	E - 1
D6	F - 1
D7	E - 2
D8	D - 2
D9	E - 1
D10	E - 2
D11	F - 2
D12	F - 2
D13	F - 1
D14	A - 1
D15	A - 1
D16	F - 2
E1	H - 2
IC2	A - 2
IC3	C - 2
IC9	D - 2
IC10	A - 1
IC15	G - 2
Q1	F - 2
Q2	F - 2
Q3	C - 2
Q4	C - 2
Q6	D - 1
Q7	D - 1
Q8	D - 1
Q9	E - 1
Q10	E - 1
Q11	E - 2
Q12	D - 2
Q13	F - 1
Q14	E - 2
Q15	F - 2
Q16	F - 2
Q17	F - 1
Q18	A - 1
Q19	F - 2
Q20	C - 2
Q21	F - 2
Q22	F - 2
S1	B - 2
S2	B - 2
S3	A - 2
S4	D - 1
S5	E - 1
S6	E - 2
S7	D - 2
S8	F - 1
S9	E - 2
S10	F - 2
S11	C - 2
TP1	A - 1
TP2	A - 1
X1	B - 1



S/N; 10191 and higher

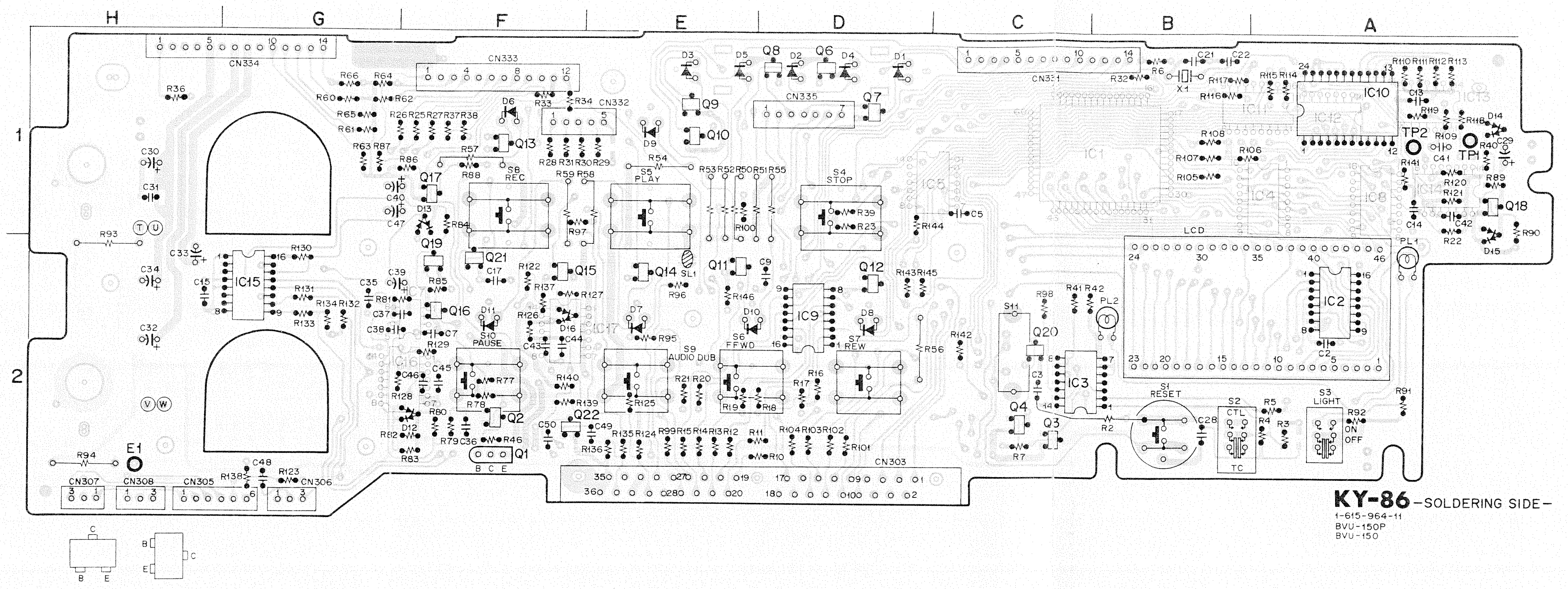
CN303	F - 2
CN305	I - 2
CN306	H - 2
CN307	H - 2
CN308	H - 2
CN331	C - 1
CN332	F - 1
CN333	G - 1
CN334	I - 1
CN335	E - 1
D1	D - 1
D2	E - 1
D3	F - 1
D4	E - 1
D5	E - 1
D6	G - 1
D7	F - 2
D8	D - 2
D9	F - 1
D10	E - 2
D11	G - 2
D12	H - 2
D13	G - 1
D14	B - 1
D15	A - 1
D16	B - 2
E - 1	I - 2
IC1	C - 1
IC2	B - 1
IC3	B - 2
IC4	C - 2
IC5	A - 1
IC7	G - 2
IC8	D - 2
IC9	E - 2
IC10	B - 1
IC11	E - 2
IC12	B - 1
IC13	A - 1
IC14	A - 1
IC15	F - 2
IC16	A - 2
IC17	B - 2
LCD	B - 1
PL1	C - 2
PL2	A - 1
Q1	G - 2
Q2	G - 2
Q3	B - 2
Q4	B - 2
Q6	E - 1
Q7	D - 1
Q8	E - 1
Q9	F - 1
Q10	F - 1
Q11	E - 1
Q12	D - 1
Q13	G - 1
Q14	F - 1
Q15	F - 1
Q16	G - 2
Q17	G - 1
Q18	B - 1
Q19	G - 2
Q20	B - 2
Q21	G - 2
Q22	G - 2
S1	C - 2
S2	B - 2
S3	B - 2
S4	E - 1
S5	F - 1
S6	E - 2
S7	D - 2
S8	G - 1
S9	F - 2
S10	G - 2
S11	D - 2
TP1	A - 1
TP2	A - 1
X1	B - 1



KY-86 (FUNCTION KEY/DISPLAY)

S/N; UP TO 10190

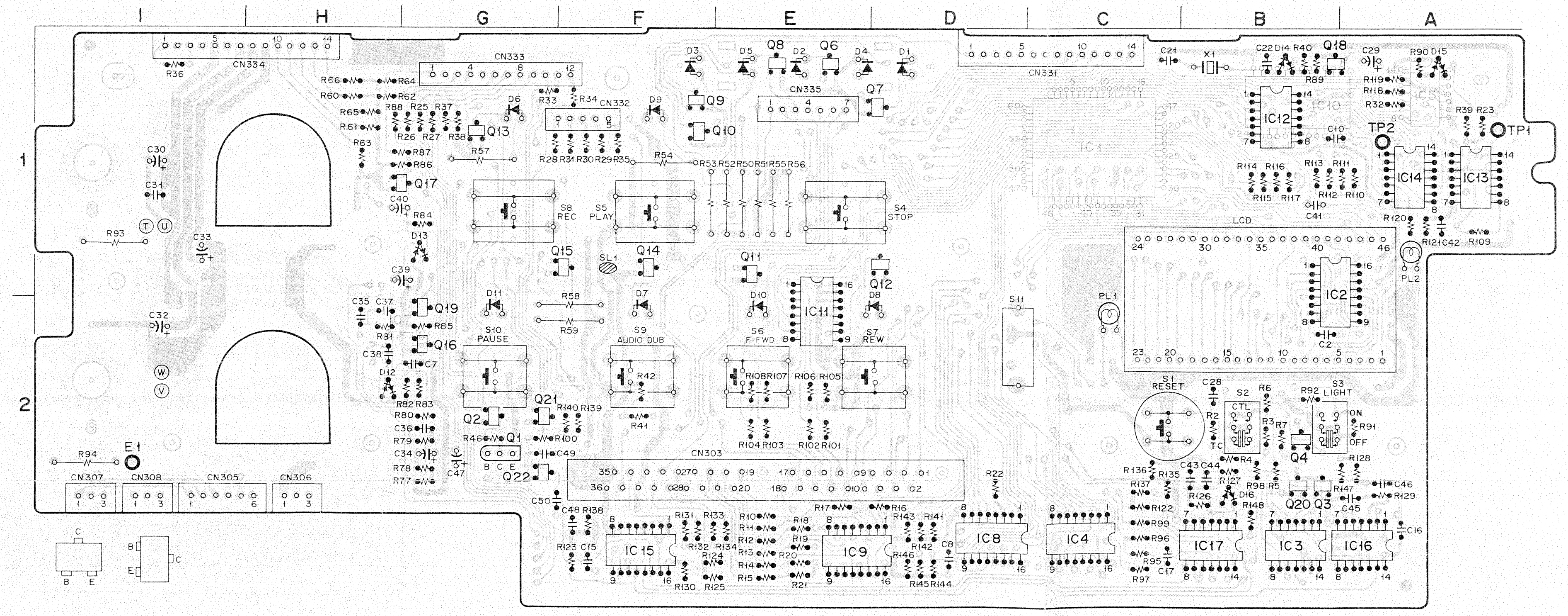
A-1
A-1
B-1



KY-86 -SOLDERING SIDE-
1-615-964-11
BVU-150P
BVU-150

S/N; 10191 and higher

C-2
B-2
B-2
E-1
F-1
E-2
D-2
G-1
F-2
G-2
D-2
A-1
A-1
B-1

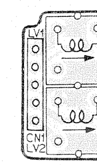


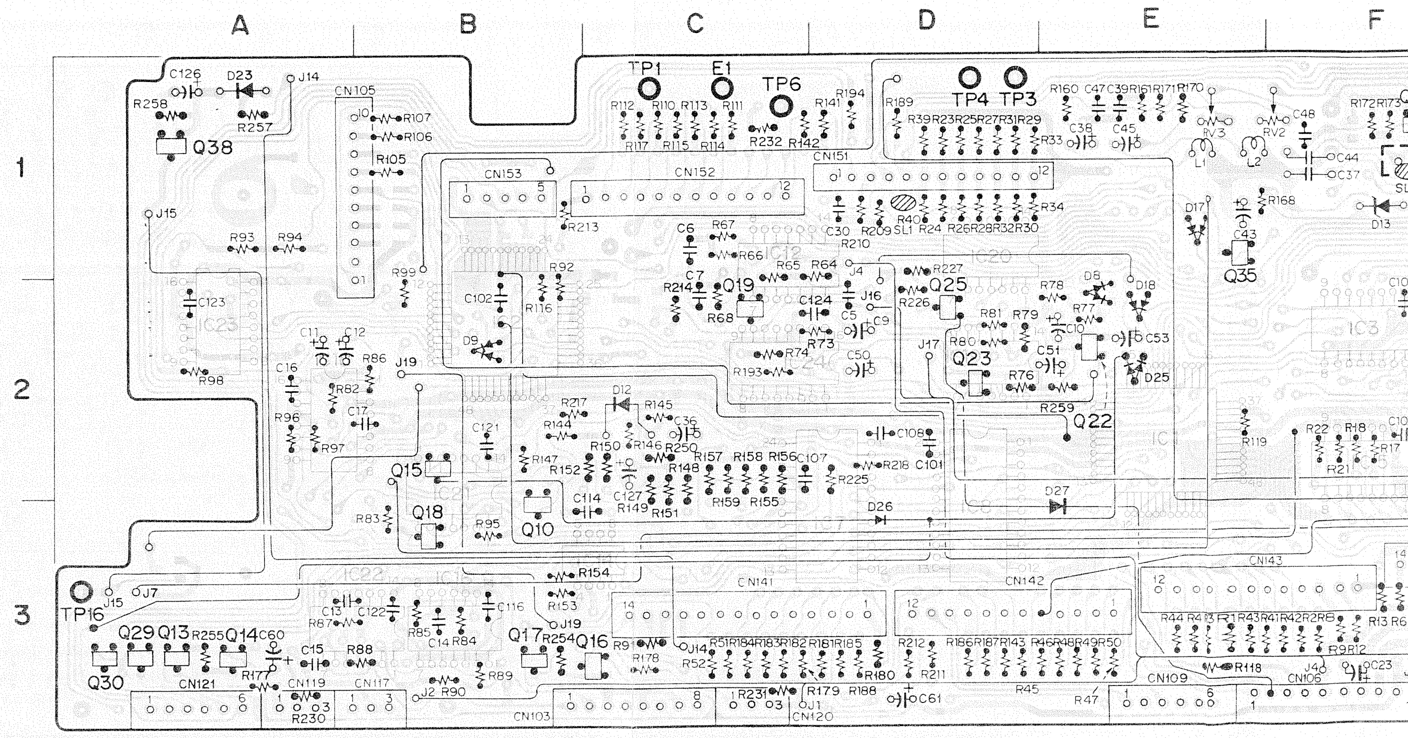
KY-86 -SOLDERING SIDE-
1-615-964-12
BVU-150
BVU-150P

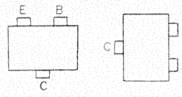
Ref. No.	Type	Pin No.			
		+12V	+6V	+5V	GND
IC 1	CXQ88501-350Q			18	42
IC 2	CXQ88501-351Q			18	42
IC 3	TC4512BF			16	8
IC 4	TC4512BF			16	8
IC 5	TC4512BF			16	8
IC 6	TC4512BF			16	8
IC 7	μPD82C43G			24	12
IC 8	μPD82C43G			24	12
IC 9	MB88201-173N			16	8
IC 10	TC40H000F			14	7
IC 11	TC4024BF			14	7
IC 12	TC4011BF		14		7
IC 13	NJM4558M	8			4
IC 14	NJM2903M	8			4
IC 15	NJM4560M			8	4
IC 16	TC4030BF			14	7
IC 17	NJM2903M	8			4
IC 18	TC4538BF			16	8
IC 19	TC4081BF			14	7
IC 20	TC4011BF			14	7
IC 21	TC4081BF			14	7
IC 22	TC4081BF			14	7
IC 23	TC4053BF			16	8
IC 24	TC4538BF			16	8

CN103	C - 3
CN105	B - 1
CN106	F - 3
CN107	I - 3
CN109	E - 3
CN115	G - 3
CN116	G - 3
CN117	B - 3
CN118	F - 3
CN119	A - 3
CN120	C - 3
CN121	A - 3
CN122	I - 3
CN141	C - 3
CN142	D - 3
CN143	E - 3
CN144	G - 3
CN151	D - 1
CN152	C - 1
CN153	B - 1
D1	I - 1
D2	I - 1
D3	I - 1
D4	H - 1
D5	H - 1
D6	H - 1
D8	E - 2
D9	B - 2
D10	I - 2
D11	I - 3
D12	C - 2
D13	F - 1
D17	E - 1
D18	E - 2
D19	H - 3
D20	G - 2
D23	A - 1
D24	H - 2
E1	C - 1
IC1	E - 2
IC2	B - 2
IC3	F - 2
IC4	G - 2
IC5	F - 2
IC6	G - 2
IC7	D - 3
IC8	D - 3
IC9	G - 2
IC10	I - 2
IC11	H - 2
IC12	C - 1
IC13	H - 1
IC14	C - 3
IC15	G - 1
IC16	B - 3
IC17	H - 2
IC18	A - 2
IC19	D - 2
IC20	D - 1
IC21	B - 2
IC22	B - 3
IC23	A - 2
IC24	C - 2
Q1	I - 1
Q2	I - 1
Q3	I - 3
Q4	I - 3
Q5	I - 2
Q6	I - 3
Q7	G - 3
Q8	G - 3
Q9	H - 3
Q10	B - 3
Q11	G - 1
Q12	F - 1
Q13	A - 3
Q14	A - 3
Q15	B - 2
Q16	C - 3
Q17	B - 3
Q18	B - 3
Q19	C - 2
Q20	H - 1
Q22	E - 2
Q23	D - 2
Q24	H - 2
Q25	D - 2
Q27	A - 3
Q28	H - 3
Q29	A - 3
Q30	A - 3
Q32	H - 2
Q33	H - 2
Q34	I - 2
Q35	E - 1
Q36	C - 2
Q37	C - 2
RV1	H - 1
RV2	F - 1
RV3	E - 1
TP1	C - 1
TP3	D - 1
TP4	D - 1
TP5	H - 1
TP6	C - 1
TP9	H - 1
TP16	A - 3
X1	I - 2
X2	G - 3

SY-18B (SYSTEM CONTROL)
DUS-5 (SOLAR BATTERY)
DUS-33 (VAR. INDUCTOR)
LE-20 (LED FOR TAPE BEGIN/END DET)
LE-21 (LED FOR TAPE BEGIN/END DET)







SY-18B (SYSTEM CONTROL)
DUS-5 (SOLAR BATTERY)
DUS-33 (VAR, INDUCTOR)
LE-20 (LED FOR TAPE BEGIN/END DET)
LE-21 (LED FOR TAPE BEGIN/END DET)

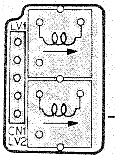
D - 2
D - 1
B - 2
B - 3
A - 2
C - 2

I - 1
I - 1
I - 3
I - 3
I - 2
I - 3
G - 3
G - 3
H - 3
B - 3
G - 1
F - 1
A - 3
A - 3
B - 2
C - 3
B - 3
B - 3
C - 2
H - 1
E - 2
D - 2
H - 2
D - 2
A - 3
H - 3
A - 3
A - 3
H - 2
H - 2
I - 2
E - 1
C - 2
C - 2

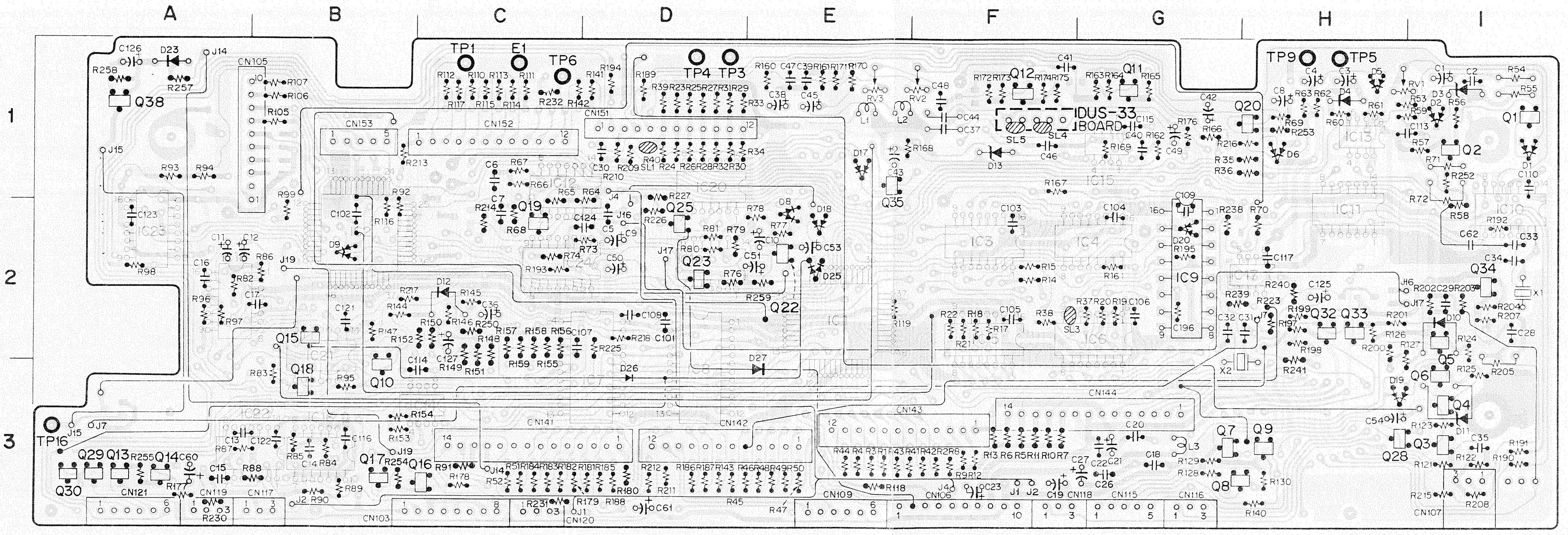
H - 1
F - 1
E - 1

C - 1
D - 1
D - 1
H - 1
C - 1
H - 1
A - 3

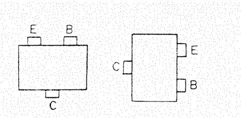
I - 2
G - 3

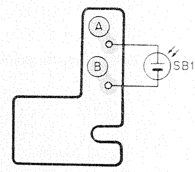


DUS-33
-SOLDERING SIDE-
1-613-317-12
BVU-150P
BVU-150

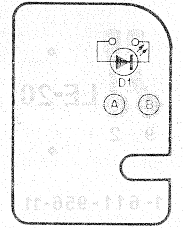


SY-18 -SOLDERING SIDE-
1-611-945-15
BVU-150P - - - SY-18C
BVU-150 - - - - SY-18B

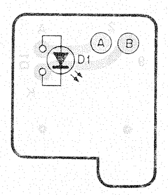




DUS-5
-SOLDERING SIDE-
1-611-964-11,12
BVU-150P
BVU-150



LE-20
-SOLDERING SIDE-
1-611-956-11,12
BVU-150P



LE-21
-SOLDERING SIDE-
1-611-957-11,12
BVU-150P
BVU-150

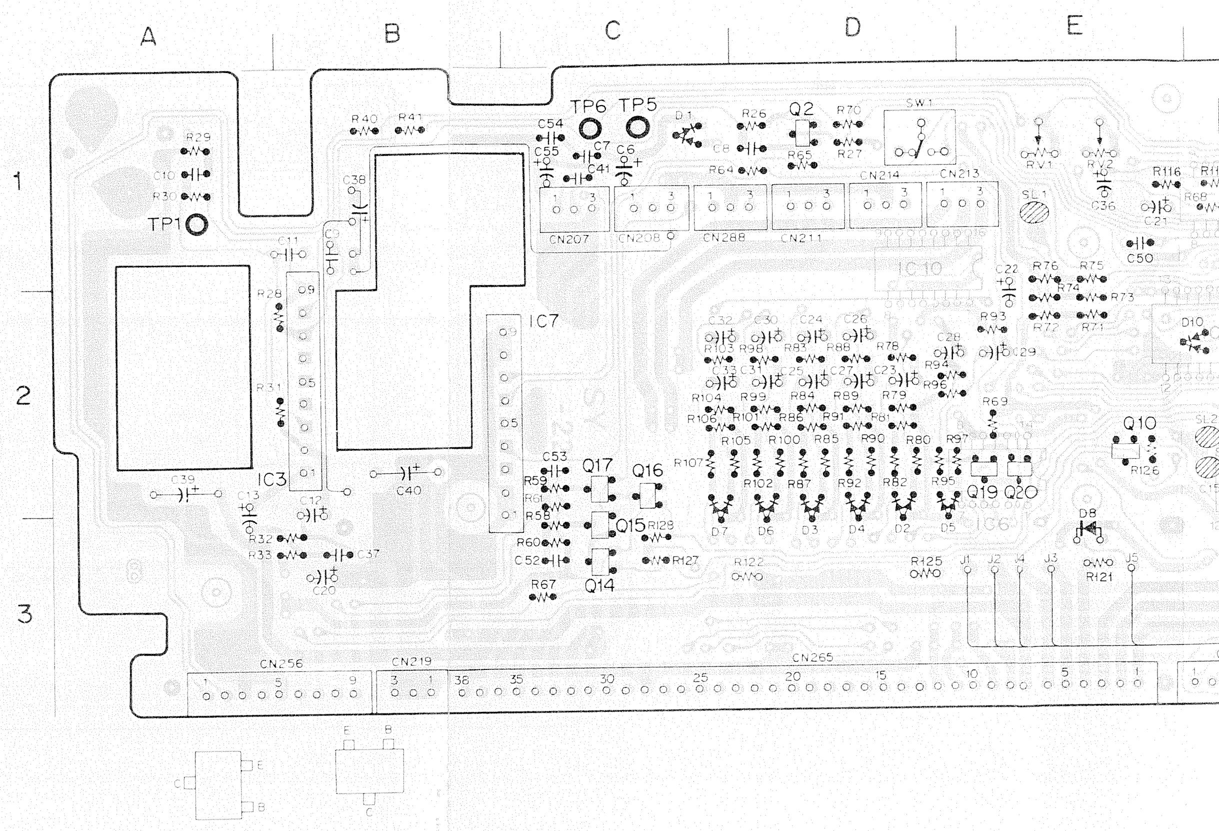
SY-22A (SYSTEM CONTROL)
DUS-4 (TENREG SW)

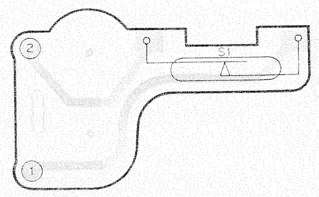
Ref. No.	Type	Pin No.	
		+5V	GND
IC 1	TC40H002F	14	7
IC 2	MB88501-247M	18	42
IC 3	TA7357AP	*	5
IC 4	MN1237AD	*	1
IC 5	μPD82C43G	24	12
IC 6	TC4001BF	14	7
IC 7	M54543L	1, 9	5
IC 8	TC4538BF	16	8
IC 9	μPD82C43G	24	12
IC 10	TC4049BF	1	8
IC 11			

*REFER TO SCHEMATIC

CN201	H - 3
CN202	G - 3
CN203	G - 3
CN204	F - 3
CN207	C - 1
CN208	C - 1
CN209	H - 3
CN210	G - 3
CN211	D - 1
CN212	G - 3
CN213	E - 1
CN214	D - 1
CN215	H - 3
CN216	H - 3
CN217	I - 3
CN218	I - 3
CN219	B - 3
CN220	F - 3
CN256	A - 3
CN261	F - 1
CN262	G - 1
CN263	H - 1
CN265	D - 3
CN288	D - 1
D1	C - 1
D2	D - 3
D3	D - 3
D4	D - 3
D5	D - 3
D6	D - 3
D7	C - 3
D8	E - 3
D9	H - 1
D10	F - 2
D11	F - 2
E1	G - 2
IC1	G - 1
IC2	H - 2
IC3	B - 2
IC4	G - 2
IC5	F - 2
IC6	E - 2
IC7	C - 2
IC8	F - 1
IC9	F - 2
IC10	D - 1
IC11	F - 3

Q2	D - 1
Q3	H - 2
Q8	F - 3
Q9	F - 3
Q10	E - 2
Q11	F - 2
Q12	F - 2
Q13	F - 2
Q14	C - 3
Q15	C - 3
Q16	C - 2
Q17	C - 2
Q19	E - 2
Q20	E - 2
Q22	G - 2
Q26	H - 2
RV1	E - 1
RV2	E - 1
SW1	D - 1
TP1	A - 1
TP2	H - 2
TP3	H - 2
TP4	G - 1
TP5	C - 1
TP6	C - 1
TP7	G - 2





DUS-4 -SOLDERING SIDE-

1-611-963-11,12
BVU-150P
BVU-150

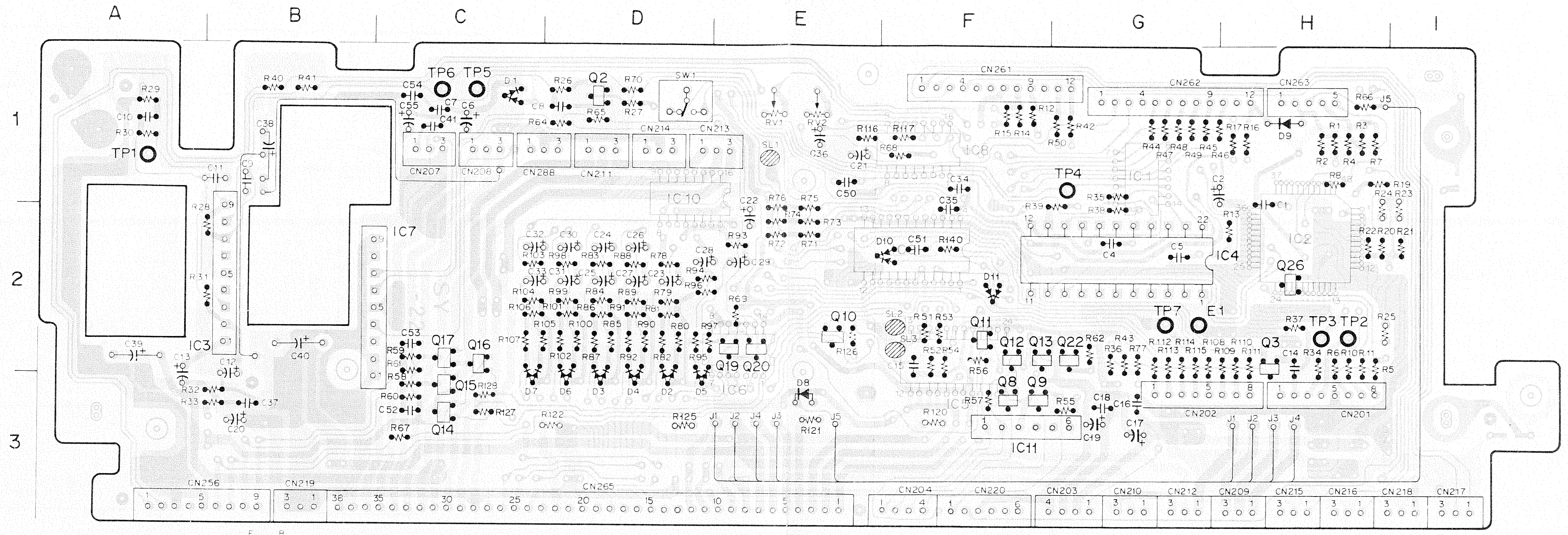
SY-22A (SYSTEM CONTROL)
DUS-4 (TENREG SW)

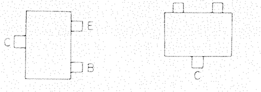
D - 1
H - 2
F - 3
F - 3
E - 2
F - 2
F - 2
F - 2
C - 3
C - 3
C - 2
C - 2
E - 2
E - 2
G - 2
H - 2

E - 1
E - 1

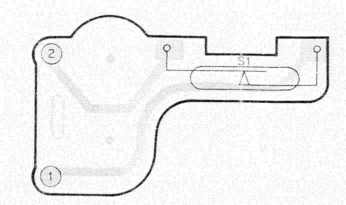
D - 1

A - 1
H - 2
H - 2
G - 1
C - 1
C - 1
G - 2



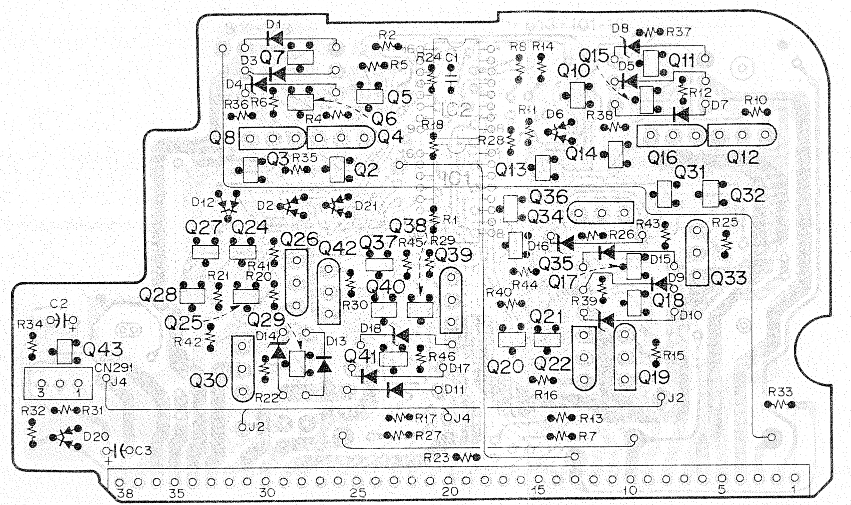


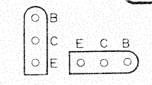
SY-22A - SOLDERING SIDE -
1-611-946-15
BVU-150P
BVU-150



DUS-4 - SOLDERING SIDE -
1-611-963-11,12
BVU-150P
BVU-150

SY-23 (SOLENOID DRIVER)





SY-23 -SOLDERING SIDE-

1-613-101-15
BVU-150P
BVU-150

SECTION 17
SPARE PARTS AND FIXTURE

17-1. PARTS INFORMATION

(1)

> The shaded and ⚠ -marked components are critical to safety.
> Replace only with same components as specified.

(2) Replacement Parts supplied from the Sony Parts Center will sometimes have a different shape from the original parts. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".
This manual's exploded views and electrical spare parts list indicate the part numbers of "the standardized genuine parts at the present". Regarding engineering part changes in out engineering department, refer to Sony service bulletins and service manual supplements.

(3) The parts marked with "s" in the SP column of the exploded views and electrical spare parts list are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

(4) Item with no part number and/or no description are not stocked because they are seldom required for routine service.

(5) (T) after a spring description is shown on the exploded views in order to indicate the number of a spring turn required for the use.
(Example)
Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

17-2. EXPLODED VIEW

Exploded views are composed of the following blocks.

(1) Reel Chassis Block (1) (take-up side)
- take-up reel table
- take-up side brake shoe
- mis-recording switch
- brake solenoid
- eject lever

(2) Reel Chassis Block (2) (supply side)
- supply reel table
- supply side brake shoe
- tension regulator
- cassette in switch
- brake solenoid
- tension solenoid

(3) Reel Chassis Block (3) (driving block)
- idler tire
- idler solenoid

(4) Reel Chassis Block (4) (back side)
- drum motor
- reel motor
- drive belt
- cassette-lock back
- printed circuit board

(5) T.U Arm and Ring Stopper Blocks
- T.U arm
- tape end detector
- ring stopper

(6) Threading Motor Block
- threading motor

(7) Pinch Pressure Block
- pinch solenoid
- pinch pressure mechanism

(8) Threading Ring Block
- threading ring

(9) Head Drum, Stationary Head and Tape Guide Blocks
- head drum
- rotary upper drum
- capstan motor
- full erase head
- audio/CTL head
- tape guides
- tape beginning sensor

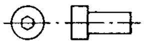
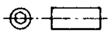
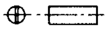
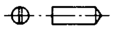
(10) Cassette-up Compartment Block
- cassette-up compartment

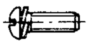
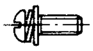
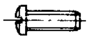
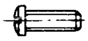
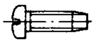
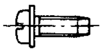
(11) Connector Panel and Audio Board Blocks
- connector panel
- audio systm circuit board

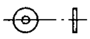
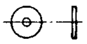
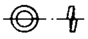
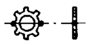
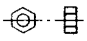
(12) Printed Circuit Board and Frame Blocks
- printed circuit board
- NR block
- frame chassis

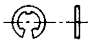
(13) Front Panel and Function Key Blocks
- front panel
- level meter
- function key board

(14) Ornamental Panel Block
- upper case
- lower case
- cassette-up compartment lid

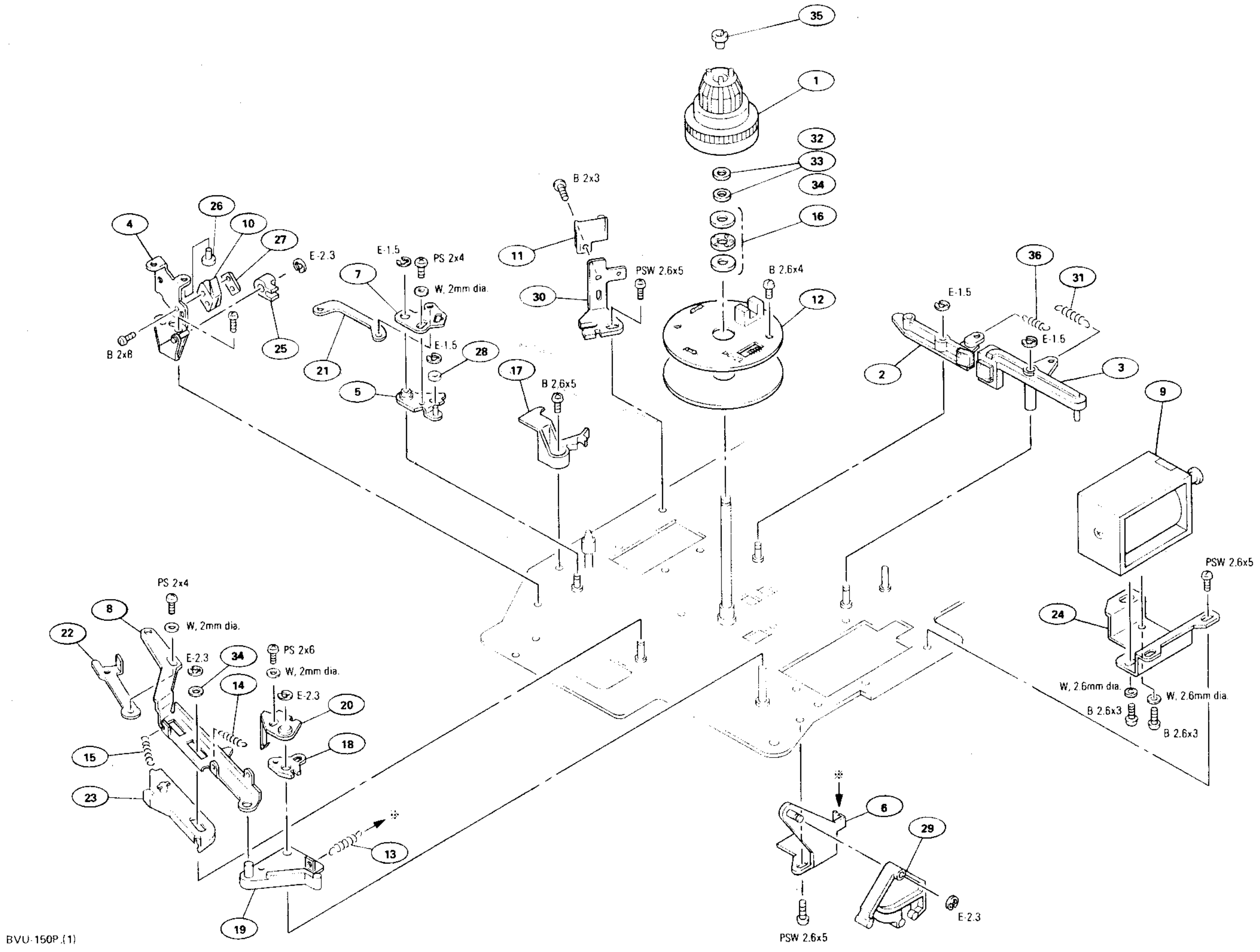
	HEXAGON SOCKET SCREW 	HEXAGON SET SCREW 	(–) SET SCREW FLAT POINT 	(–) SET SCREW CONE POINT 
2.6 x 3	———	7-621-734-09	———	———
2.6 x 4	7-621-996-24	7-621-735-09	———	———
2.6 x 5	———	7-621-736-09	———	———
2.6 x 6	7-683-412-05	———	———	7-621-712-55
2.6 x 8	7-683-413-05	———	———	7-621-712-65
2.6 x 10	———	———	———	7-621-712-75
3 x 4	———	7-683-238-01	———	———
3 x 5	———	———	7-683-175-01	———
3 x 6	7-683-403-04	———	7-683-176-01	7-683-176-21
3 x 8	7-683-404-04	———	———	7-683-177-21
3 x 10	7-683-405-04	———	———	7-683-178-21
3 x 12	———	———	———	7-683-179-21

	PS 	PSW 	B (BZn-N) 	B (Cr-N) 	PTT 	PTTWH 
2.6 x 4	7-621-972-05	———	7-621-912-10	7-621-912-18	———	7-687-508-31
2.6 x 6	7-621-972-25	7-621-981-15	7-621-912-30	7-621-912-38	———	7-687-501-31
2.6 x 8	7-621-972-35	7-621-981-25	7-621-912-40	7-621-912-48	———	7-687-502-31
2.6 x 10	7-621-972-45	7-621-981-35	7-621-912-50	7-621-912-58	———	7-687-503-31
2.6 x 12	7-621-972-55	7-621-981-45	7-621-912-60	7-621-912-68	———	7-687-504-31
2.6 x 14	7-621-972-65	7-621-981-55	7-621-912-70	7-621-912-78	———	7-687-505-31
2.6 x 16	7-621-972-75	7-621-981-65	7-621-912-80	7-621-912-88	———	7-687-506-31
2.6 x 20	7-621-972-85	7-621-981-75	7-621-912-90	7-621-912-98	———	7-687-507-31
3 x 5	7-686-446-01	———	———	———	———	———
3 x 6	7-686-447-01	7-686-527-01	7-686-624-09	7-686-624-04	7-687-411-31	7-687-510-31
3 x 8	7-686-448-01	7-686-528-01	7-686-625-09	7-686-625-04	7-687-412-31	7-687-511-31
3 x 10	7-686-449-01	7-686-529-01	7-686-626-09	7-686-626-04	7-687-413-31	7-687-512-31
3 x 12	7-686-450-01	7-686-530-01	7-686-627-09	7-686-627-04	7-687-414-31	7-687-513-31
3 x 16	7-686-452-01	7-686-532-01	7-686-629-09	7-686-629-04	———	———
3 x 20	7-686-453-01	7-686-533-01	7-686-630-09	7-686-630-04	———	———
3 x 25	7-686-454-01	7-686-534-01	7-686-631-09	7-686-631-04		
4 x 8	7-686-468-01	7-686-548-01	7-686-635-09	7-686-635-04	———	———
4 x 12	7-686-470-01	7-686-550-01	7-686-637-09	7-686-637-04	———	———
4 x 14	7-686-471-01	———	7-686-638-09	7-686-638-04	———	———
4 x 16	7-686-472-01	———	7-686-639-09	7-686-639-04	———	———
4 x 20	7-686-473-01	———	7-686-640-09	7-686-640-04	———	———

	FLAT WASHER SMALL W. 	FLAT WASHER MIDDLE W. 	SPRING WASHER SW. 	TOOTHED WASHER TYPE B LW. 	HEXAGON NUT N. 
2.6 mm	7-688-002-01	7-688-002-12	7-623-207-22	7-623-421-07	7-622-207-05
3 mm	7-688-003-01	7-688-003-12	7-688-003-11	7-623-422-07	7-684-023-04
4 mm	7-688-004-01	7-688-004-12	7-623-210-22	7-623-423-07	7-684-024-04
5 mm	7-688-005-01	7-688-005-01	7-623-212-22	———	7-684-025-04

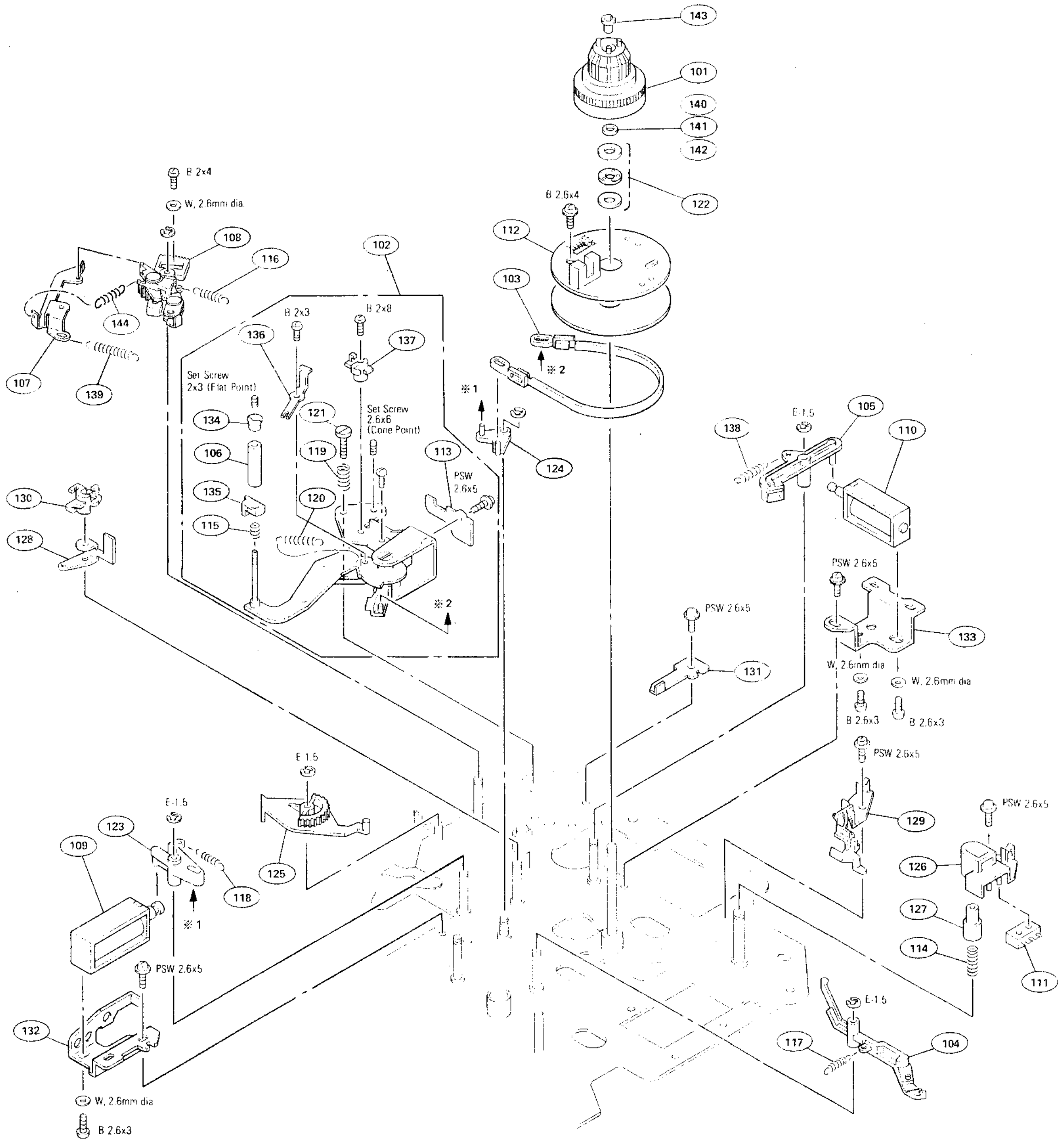
	STOP RING E TYPE E. 
2	7-624-104-04
2.3	7-624-105-04
3	7-624-106-04
4	7-624-108-04
5	7-624-109-04
6	7-624-110-04

Reel Chassis Block (1) (Take-up Side)



No.	Part No.	SP	Description
1	A-6739-034-A	s	TABLE ASSY, REEL
2	X-3685-818-2	s	ARM ASSY, T SOFT BRAKE
3	X-3685-819-2	s	ARM ASSY, BRAKE
4	X-3685-829-1	o	BASE ASSY, MISS RECORDING
5	X-3685-830-1	o	RING ASSY, SLIDE STOPPER
6	X-3685-831-1	o	HOLDER ASSY, VH RING
7	X-3685-833-1	o	PLATE ASSY, ADJUSTMENT, LINK
8	X-3685-838-1	o	SLIDER ASSY, E
9	1-454-383-11	s	SOLENOID, PLUNGER
10	1-570-028-11	s	SWITCH, MICRO
11	1-611-957-11	o	PRINTED CIRCUIT BOARD, LE-21
12	1-611-960-11	o	PRINTED CIRCUIT BOARD, PC-22
13	3-465-158-XX	s	SPRING, TENSION (16T)
14	3-567-029-00	s	SPRING, TENSION
15	3-573-930-00	s	SPRING, TENSION
16	3-676-322-00	s	BEARING, THRUST
17	3-685-802-01	o	GUIDE, PINCH ROLLER
18	3-685-809-01	o	PLATE, ADJUSTMENT, E. SWITCH
19	3-685-810-01	o	LINK, REPLACEMENT, H
20	3-685-811-01	s	ACTUATOR, E SWITCH
21	3-685-812-01	o	JOINT, KM
22	3-685-813-01	o	JOINT, SLIDER, E
23	3-685-814-01	s	PRESSURE, E
24	3-685-832-01	o	BASE, B-SOL
25	3-685-850-01	o	LEVER, RELEASE, C LOCK
26	3-685-851-01	o	SHAFT, MS
27	3-685-852-01	o	NUT (M2), PLATE
28	3-685-860-01	s	ROLLER, E STOPPER
29	3-685-864-01	o	LINK, VH CHANGE
30	3-685-867-01	o	PLATE, S-LED
31	3-686-070-01	s	SPRING, TENSION
32	3-701-439-01	s	WASHER, POLY 3MM DIA., 0.13T
33	3-701-439-11	s	WASHER, POLY 3MM DIA., 0.25T
34	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
35	3-703-074-00	s	CAP 3, SHAFT
36	4-847-057-00	s	SPRING, TENSION

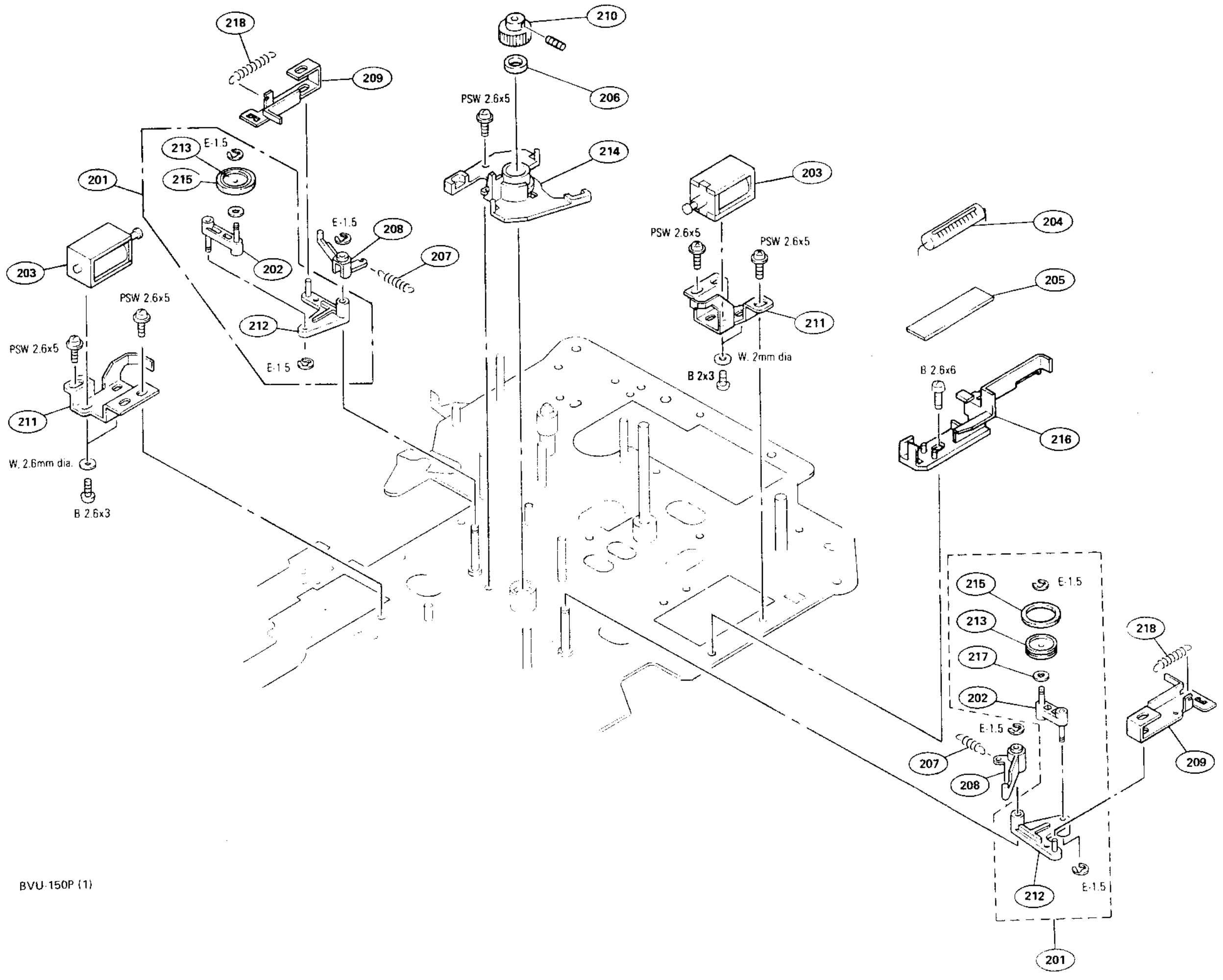
Reel Chassis Block (2) (Supply Side)



BVU-150P (2)

No.	Part No.	SP	Description
101	A-6739-034-A	s	TABLE ASSY, REEL
102	A-6742-055-A	s	TENSION REGULATOR ASSY
103	X-3685-814-4	s	BAND ASSY, TENSION REGULATOR
104	X-3685-817-2	s	ARM ASSY, S SOFT BRAKE
105	X-3685-819-2	s	ARM ASSY, BRAKE
106	X-3685-820-1	s	ROLLER ASSY, T.R
107	X-3685-865-1	o	ARM (C) ASSY, T.R DRAWER
108	X-3685-866-1	o	ARM SUB ASSY, T.R DRAWER
109	1-454-382-11	s	SOLENOID, PLUNGER
110	1-454-383-11	s	SOLENOID, PLUNGER
111	1-570-028-21	s	SWITCH, MICRO
112	1-611-960-11	o	PRINTED CIRCUIT BOARD, PC-22
113	1-611-963-11	o	PRINTED CIRCUIT BOARD, DUS-4
114	2-527-096-00	s	SPRING, COMPRESSION
115	3-305-432-00	s	SPRING, COMPRESSION
116	3-424-031-00	s	SPRING, RECORD SLIDER
117	3-508-108-XX	s	SPRING, TENSION (12T)
118	3-533-373-00	s	SPRING, TENSION
119	3-534-237-00	s	SPRING, COMPRESSION
120	3-555-212-00	s	SPRING, TENSION
121	3-650-191-11	s	SCREW, LOCK
122	3-676-322-00	s	BEARING, THRUST
123	3-685-815-02	o	ARM (A), RELEASE, T.R
124	3-685-816-01	o	ARM (B), RELEASE, T.R
125	3-685-817-01	o	ARM (A), DRAWER, T.R
126	3-685-820-01	o	COVER, SWITCH
127	3-685-821-01	o	PIN, SWITCH
128	3-685-826-01	s	ARM, RELEASE, S SOFT
129	3-685-827-01	o	HOLDER, BAND
130	3-685-828-01	o	COVER, SHAFT
131	3-685-829-03	o	STOPPER, TENSION REGULATOR
132	3-685-831-01	o	BASE, T.R.SOL
133	3-685-832-01	o	BASE, B-SOL
134	3-685-839-01	s	NUT, ADJUSTMENT, T.R
135	3-685-840-01	s	FLANGE (LOWER), T.R
136	3-685-842-01	o	ARM, MAGNET
137	3-685-999-01	o	HOLDER, SPRING
138	3-686-070-01	s	SPRING, TENSION
139	3-686-071-02	s	SPRING, TENSION
140	3-701-439-01	s	WASHER, POLY 3MM DIA., 0.13T
141	3-701-439-11	s	WASHER, POLY 3MM DIA., 0.25T
142	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
143	3-703-074-00	s	CAP 3, SHAFT
144	3-672-461-01	s	SPRING, TENSION

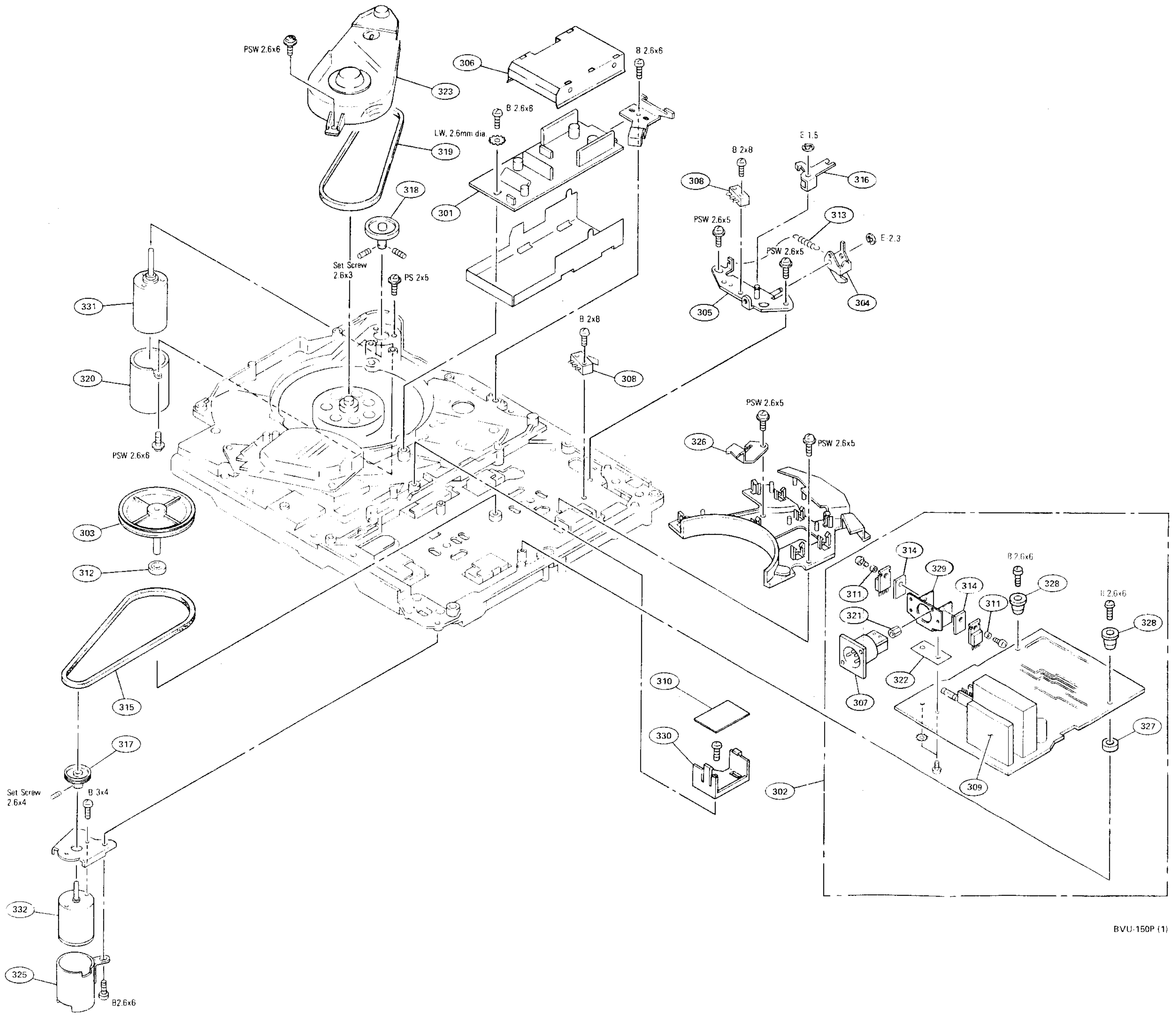
Reel Chassis Block (3) (Driving Block)



BVU-150P (1)

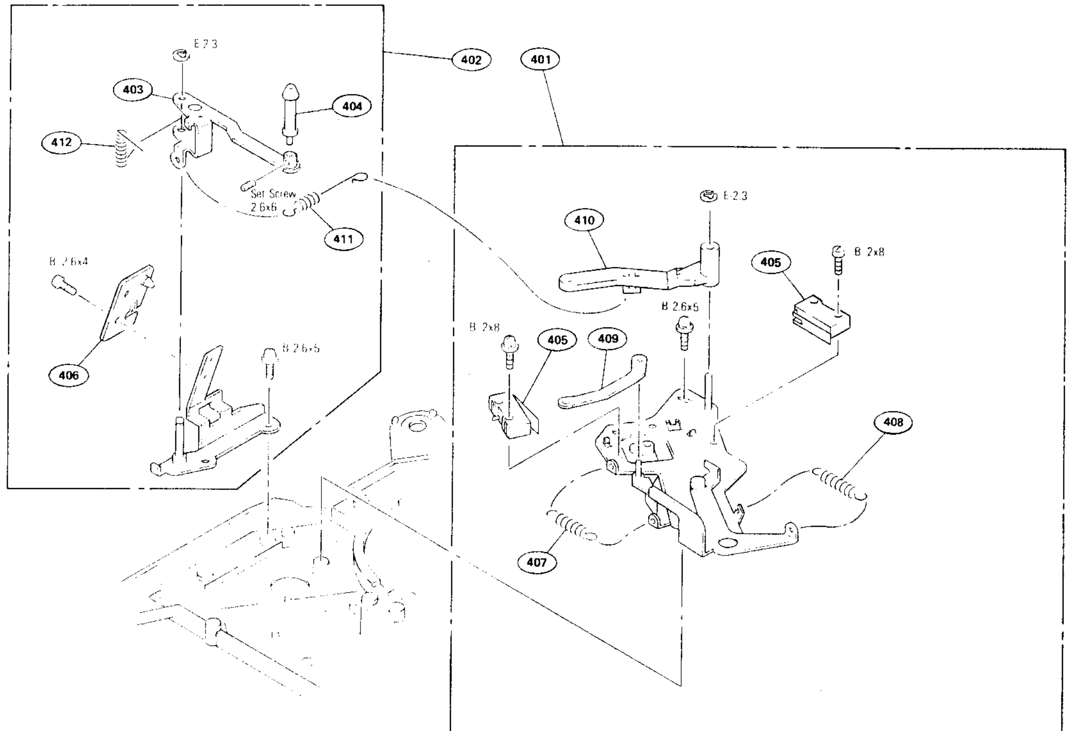
No.	Part No.	SP	Description
201	A-6740-084-A	o	IDLER ASSY
202	X-3685-813-1	o	ARM ASSY, IDLER
203	1-454-381-11	s	SOLENOID, PLUNGER
204	1-548-119-21	s	HOURS METER
205	1-613-881-11	o	PRINTED CIRCUIT BOARD, TM-19
206	3-154-507-02	s	BEARING, BALL
207	3-537-783-XX	s	SPRING, TENSION (18T)
208	3-685-822-01	o	ARM, IDLER RELEASE
209	3-685-823-01	o	PLATE, PRESS, IDLER
210	3-685-824-01	o	PULLEY, MIDWAY
211	3-685-833-01	o	BASE, I-SOL
212	3-685-835-01	s	ARM (B), IDLER
213	3-685-836-01	o	PULLEY, IDLER
214	3-685-972-01	o	RETAINER, IDLER
215	3-687-902-01	s	TIRE, IDLER
216	3-687-903-01	o	HOLDER, H.M
217	3-701-437-21	s	WASHER, POLY 2MM DIA., 0.5T
218	4-812-499-XX	s	SPRING, TENSION (15T)

Reel Chassis Block (4) (Back Side)



No.	Part No.	SP	Description
301	A-6711-650-A	o	MOUNTED CIRCUIT BOARD, RP-24
302	A-6723-281-A	o	MOUNTED CIRCUIT BOARD, PSB-4
303	X-3685-810-1	s	PULLEY ASSY, RELAY
304	X-3685-827-1	o	ARM ASSY, C LOCK
305	X-3685-828-1	o	BRACKET ASSY, C LOCK ARM
306	X-3685-864-1	o	PLATE (B) ASSY, SHIELD, RP
307	1-560-999-11	s	CONNECTOR (WITH SW)
308	1-570-028-21	s	SWITCH, MICRO
309	1-615-966-11	o	PRINTED CIRCUIT BOARD, PA-48
310	1-615-979-11	o	PRINTED CIRCUIT BOARD, CN-100
311	2-832-007-00	s	BUSHING (K), INSULATING
312	3-154-507-02	s	BEARING, BALL
313	3-571-819-00	s	SPRING, TENSION
314	3-660-978-00	s	SHEET, HEAT RESISTING
315	3-685-803-02	s	BELT, REEL
316	3-685-855-01	o	LEVER, SWITCH, LOCK
317	3-685-902-02	s	PULLEY, MOTOR
318	3-686-016-01	s	PULLEY, D MOTOR
319	3-686-017-01	s	BELT, DRUM
320	3-686-044-01	o	PLATE, SHIELD, M
321	3-686-050-01	o	SPACER, DC IN
322	3-686-053-01	o	SHEET, INSULATING, HEAT SINK
323	3-686-095-01	o	COVER, D PULLEY
325	3-687-921-01	o	CASE, SHIELD
326	3-687-947-01	o	PLATE, ELECTROSTATIC
327	3-694-704-01	o	SPACER
328	3-694-705-01	o	PIN, SPACER
329	3-694-724-01	o	BRACKET (B), DC IN
330	3-694-732-01	o	HOLDER, BA
331	8-835-030-01	s	MOTOR, DC (MNR-2900A)
332	8-835-123-01	s	MOTOR, DC (MNR-7400A)

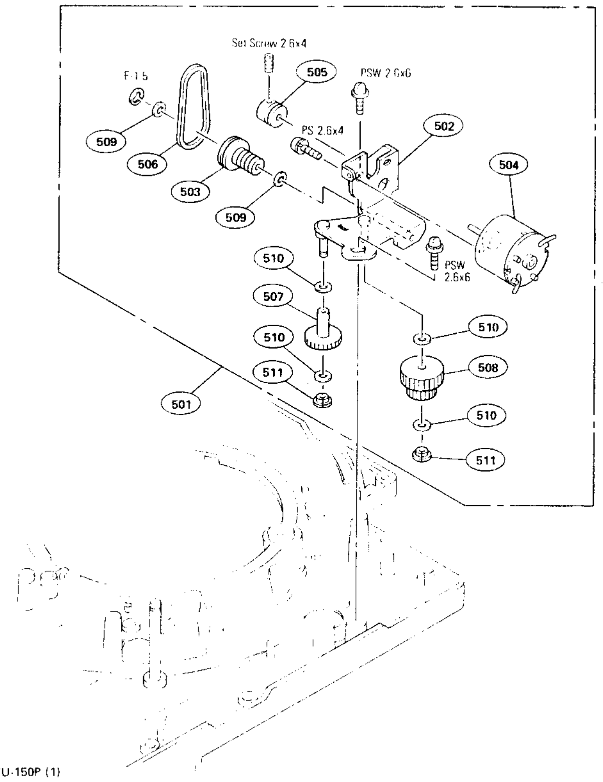
T.U Arm and Ring Stopper Blocks



BVU-150 (1)
BVU-150P (2)

No.	Part No.	SP	Description
401	A-6744-016-D	o	STOPPER ASSY, RING
402	A-6746-038-A	o	ARM ASSY, TU
403	X-3685-824-1	o	ARM ASSY, T
404	X-3685-858-1	s	ROLLER ASSY, T GUIDE
405	1-570-028-11	s	SWITCH, MICRO
406	1-611-956-11	o	PRINTED CIRCUIT BOARD, LE-20
407	3-515-170-00	s	SPRING, TENSION
408	3-535-369-XX	s	SPRIHG, TENSION (12T)
409	3-685-812-01	o	JOINT, KM
410	3-685-903-03	s	ARM, DRAWER
411	3-686-005-04	s	SPRING, TENSION
412	3-686-006-01	s	SPRING

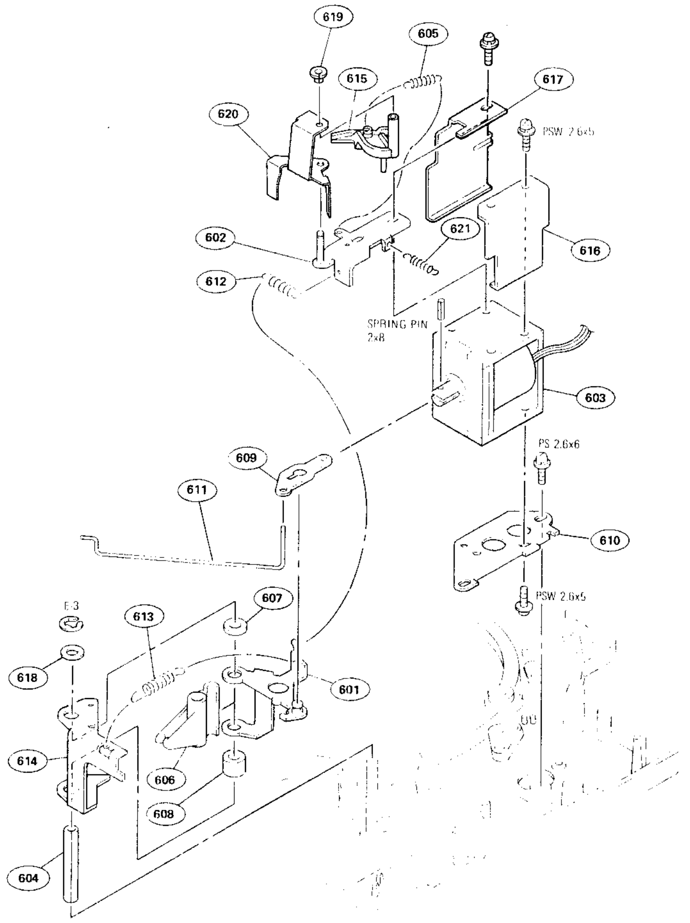
Threading Motor Block



BVU-150P (1)
BVU-150 (1)

No.	Part No.	SP	Description
501	A-6737-138-C	o	GEAR ASSY, LD
502	X-3685-845-2	o	BASE ASSY, LD GEAR
503	X-3685-851-2	s	GEAR ASSY, WORM
504	1-541-163-00	s	MOTOR
505	3-686-009-02	s	PULLEY, LD
506	3-686-010-03	s	BELT, LD
507	3-686-011-01	s	GEAR, THREADING
508	3-686-012-01	s	GEAR, DRIVE
509	3-701-437-11	s	WASHER, POLY 2MM DIA., 0.25T
510	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
511	3-703-074-00	s	CAP 3, SHAFT

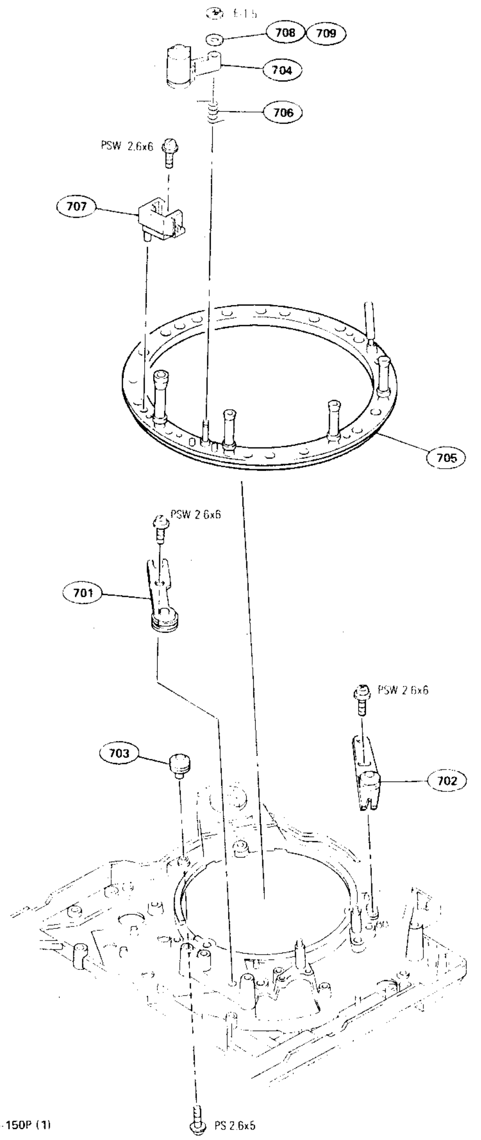
Pinch Pressure Block



BVU-150P (2)

No.	Part No.	SP	Description
601	X-3685-822-1	o	LEVER ASSY, CHARGE
602	X-3685-852-3	o	PLATE ASSY, ADJUSTMENT, S
603	1-454-386-11	s	SOLENOID, PLUNGER
604	3-668-048-21	o	SPACER (DIA. 4x28)
605	3-668-508-11	s	SPRING, TENSION
606	3-685-927-03	s	STOPPER, TAPE
607	3-685-929-01	o	SPACER
608	3-685-929-11	o	SPACER
609	3-685-931-01	o	JOINT
610	3-685-932-01	o	BASE, PINCH (SOL)
611	3-685-998-01	o	JOINT
612	3-686-003-01	s	SPRING, TENSION
613	3-686-004-01	s	SPRING, TENSION
614	3-686-007-01	o	PLATE, PRESS, PINCH
615	3-687-905-02	o	PLATE, J
616	3-687-925-01	o	PLATE, SHIELD, PSOL
617	3-687-963-01	o	PLATE (2), SHIELD, PSOL (S/N 10001 THROUGH 10020)
	3-687-963-03	o	PLATE (2), SHIELD, PSOL (S/N 10021 AND HIGHER)
618	3-701-441-21	s	WASHER, POLY 4MM DIA., 0.5T
619	3-703-075-00	s	CAP 2, SHAFT
620	3-687-978-01	o	ARM, PM
621	3-555-125-01	s	SPRING, TENSION (S/N 10021 AND HIGHER)

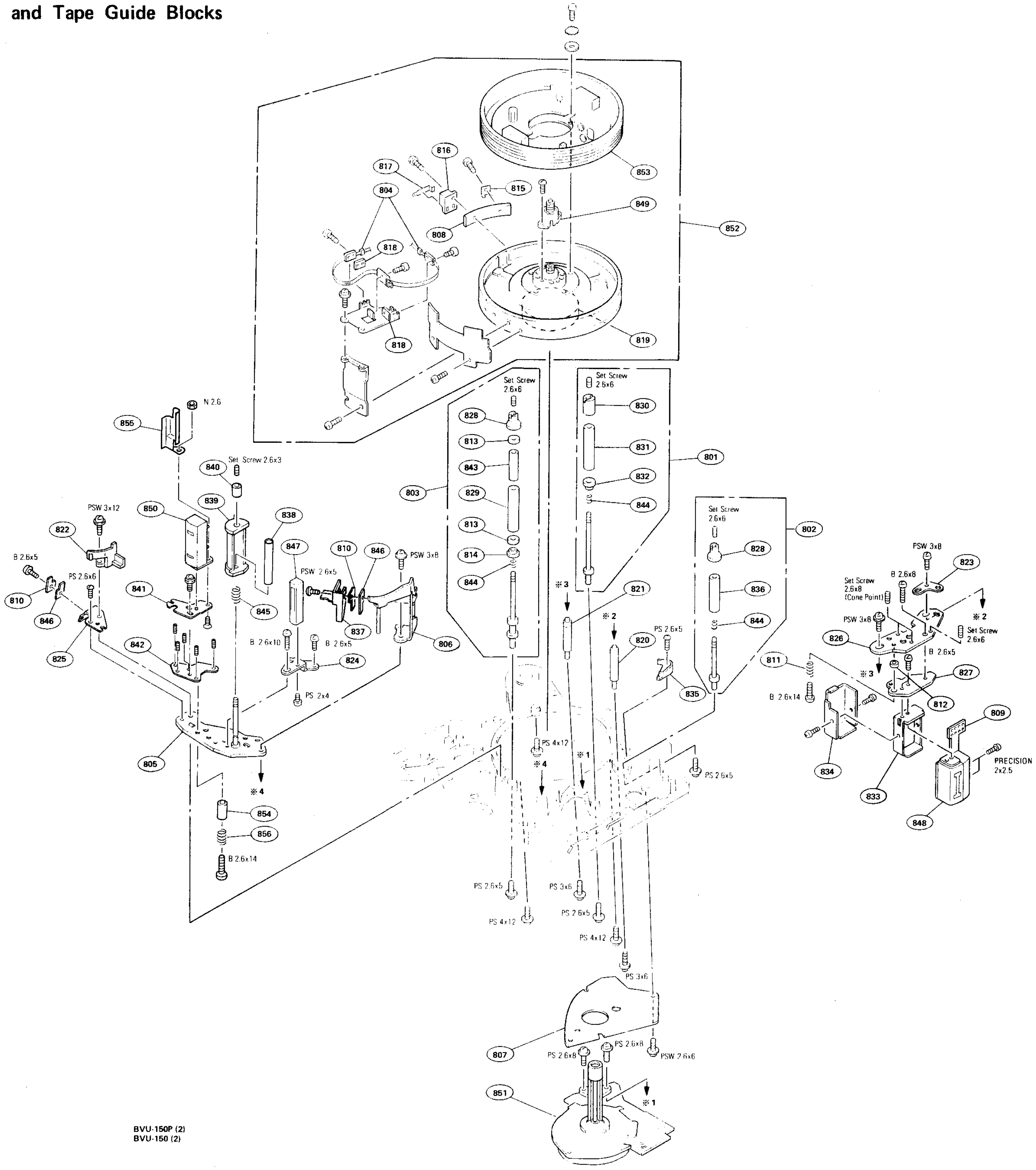
Threading Ring Block



BVU-150P (1)

No.	Part No.	SP	Description
701	X-3685-801-1	o	SUPPORT (A) ASSY, R
702	X-3685-802-1	o	SUPPORT (B) ASSY, R
703	X-3685-803-1	o	SUPPORT (C) ASSY, R
704	X-3685-804-1	s	ARM ASSY, P
705	X-3685-809-2	s	RING SUB ASSY, THREADING
706	3-685-934-01	s	SPRING
707	3-685-994-02	o	BASE, TR THREAD
708	3-701-437-01	s	WASHER, POLY 2MM DIA., 0.13T
709	3-701-437-11	s	WASHER, POLY 2MM DIA., 0.25T

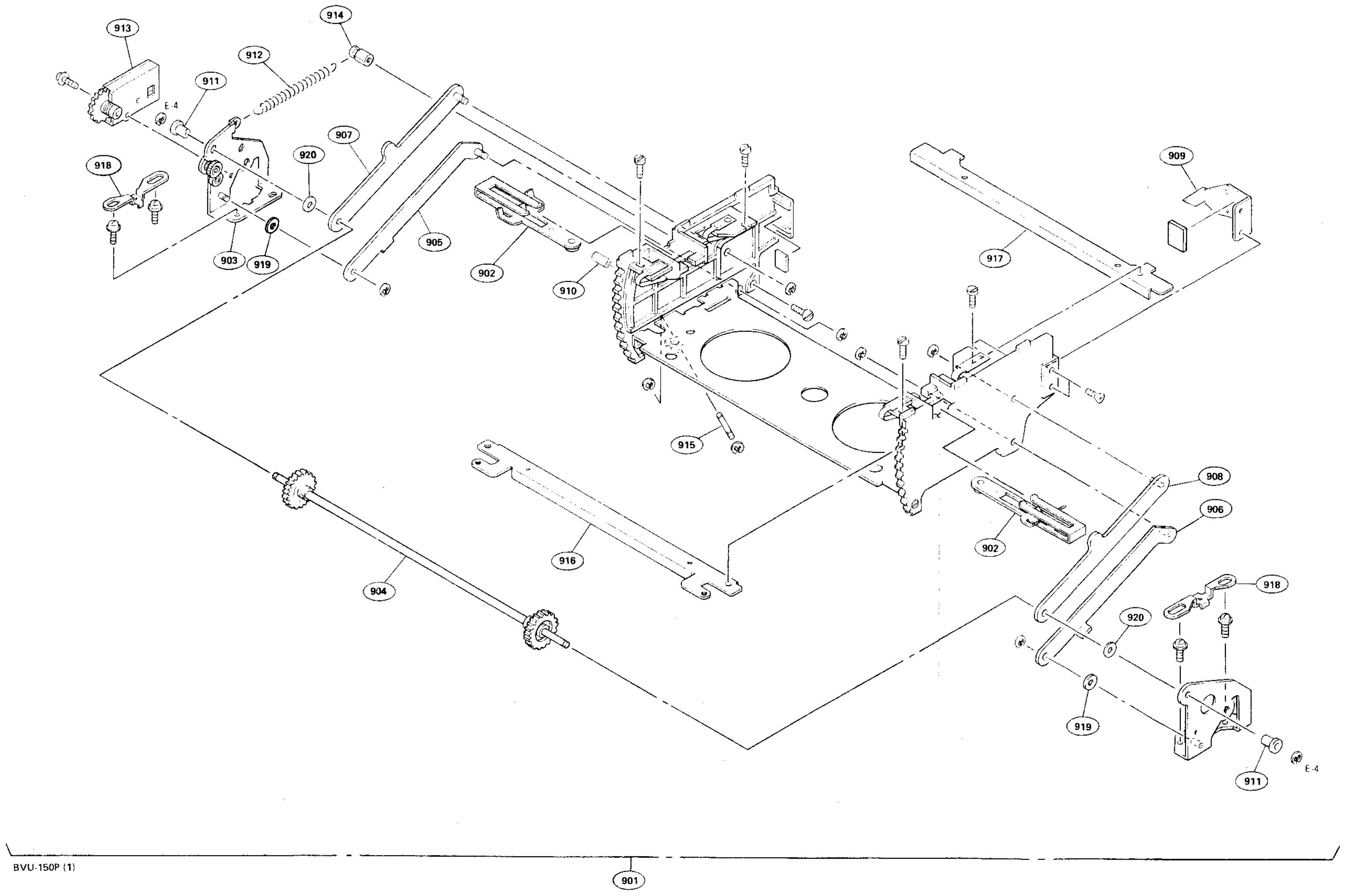
Head Drum, Stationary Head and Tape Guide Blocks



BVU-150P (2)
BVU-150 (2)

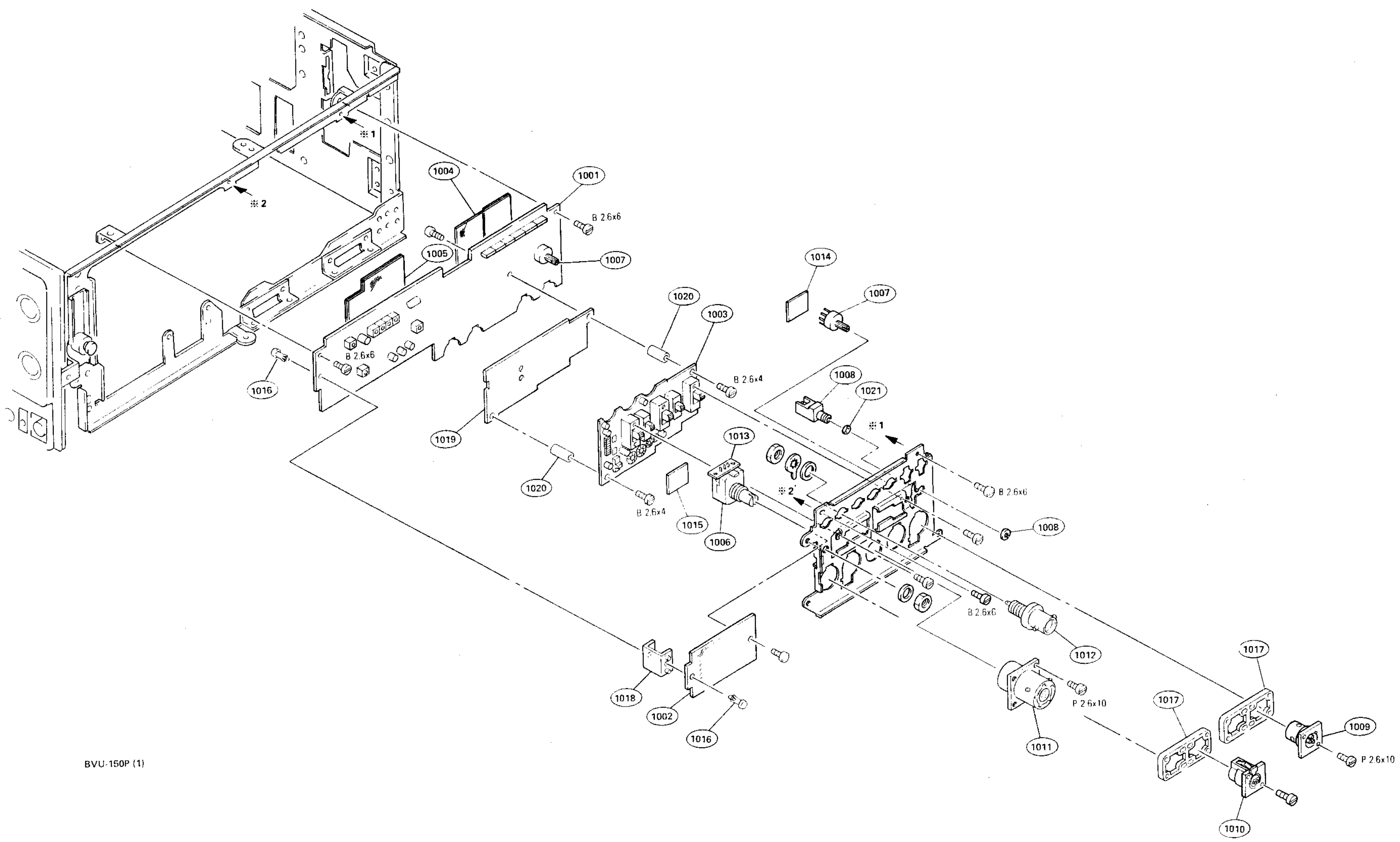
No.	Part No.	SP	Description
801	A-6746-039-A	o	TG (4) ASSY
802	A-6746-040-C	o	TG (3) ASSY
803	A-6746-041-A	o	TG (2) ASSY
804	X-3685-002-1	s	BRUSH SUB ASSY
805	X-3685-808-3	o	BASE (A) ASSY, EN
806	X-3685-811-1	s	LID OPEN SUB ASSY
807	X-3685-844-1	o	PLATE ASSY, SHIELD, CPS
808	1-586-633-00	s	DETECTOR, CONDENSATION
809	1-611-954-11	o	PRINTED CIRCUIT BOARD, DU-58
810	1-611-964-11	o	PRINTED CIRCUIT BOARD, DUS-5
811	3-437-352-00	s	SPRING, COMPRESSION
812	3-642-718-00	s	SPACER (2.6x10)
813	3-654-601-00	s	BEARING, BALL
814	3-654-602-00	s	RETAINER, BEARING
815	3-655-631-00	o	TERMINAL, GROUND
816	3-656-501-00	o	HOLDER, TERMINAL
817	3-656-502-00	o	PLATE, TERMINAL
818	3-665-001-00	o	NUT, PLATE
819	3-685-004-01	o	PULLEY, DRUM
820	3-685-804-01	o	SUPPORT (1), EX
821	3-685-805-01	o	SUPPORT (2), EX
822	3-685-806-01	o	RETAINER, TAPE
823	3-685-807-01	o	PLATE, ADJ
824	3-685-896-01	o	BASE, ERASE
825	3-685-897-01	o	BRACKET, T.D
826	3-685-899-01	o	BASE (A), EX
827	3-685-900-01	o	BASE (B), EX
828	3-685-920-01	s	FLANGE, TAPE
829	3-685-921-01	s	GUIDE, TAPE
830	3-685-924-01	s	FLANGE (U), EX
831	3-685-925-01	s	GUIDE, EX
832	3-685-926-01	s	FLANGE (L), EX
833	3-685-978-01	o	CASE, AU
834	3-685-979-01	o	CASE (REAR), AU
835	3-686-001-01	o	RETAINER (2), TAPE
836	3-686-020-03	s	GUIDE, TPAE
837	3-687-951-01	o	VISOR, INFRARED RAYS
838	3-687-968-01	s	GUIDE, TG-1
839	3-687-969-01	s	FLANGE, TG-1
840	3-687-970-01	s	SCREW, TG-1
841	3-694-702-01	o	BASE (C), EN
842	3-694-711-01	o	BASE (B), EN
843	4-855-006-01	s	SPACER (3x12)
844	4-866-143-00	s	SPRING, COMPRESSION
845	4-868-051-01	o	SPRING, COMPRESSION
846	8-719-919-10	s	DIODE 55M22LS
847	8-825-544-20	s	HEAD, ERASE
848	8-825-578-30	s	HEAD, ACE (EPS264-5803)
849	8-825-680-50	s	RING ASSY, SLIP (VO-SR5)
850	8-829-371-11	s	HEAD, T/C (PP171-5802D)
851	8-838-079-01	s	MOTOR, DC (BHF-1913A)
852	A-6709-509-A	s	HEAD DRUM ASSY, DUH-29A-R
853	A-6709-516-A	s	UPPER DRUM ASSY, DUR-29-R
854	3-642-719-00	o	SPACER (2.6x11)
855	3-698-905-01	o	PLATE, SHIELD, TC HEAD
856	3-698-906-01	s	SPRING, COMPRESSION

Cassette-up Compartment Block



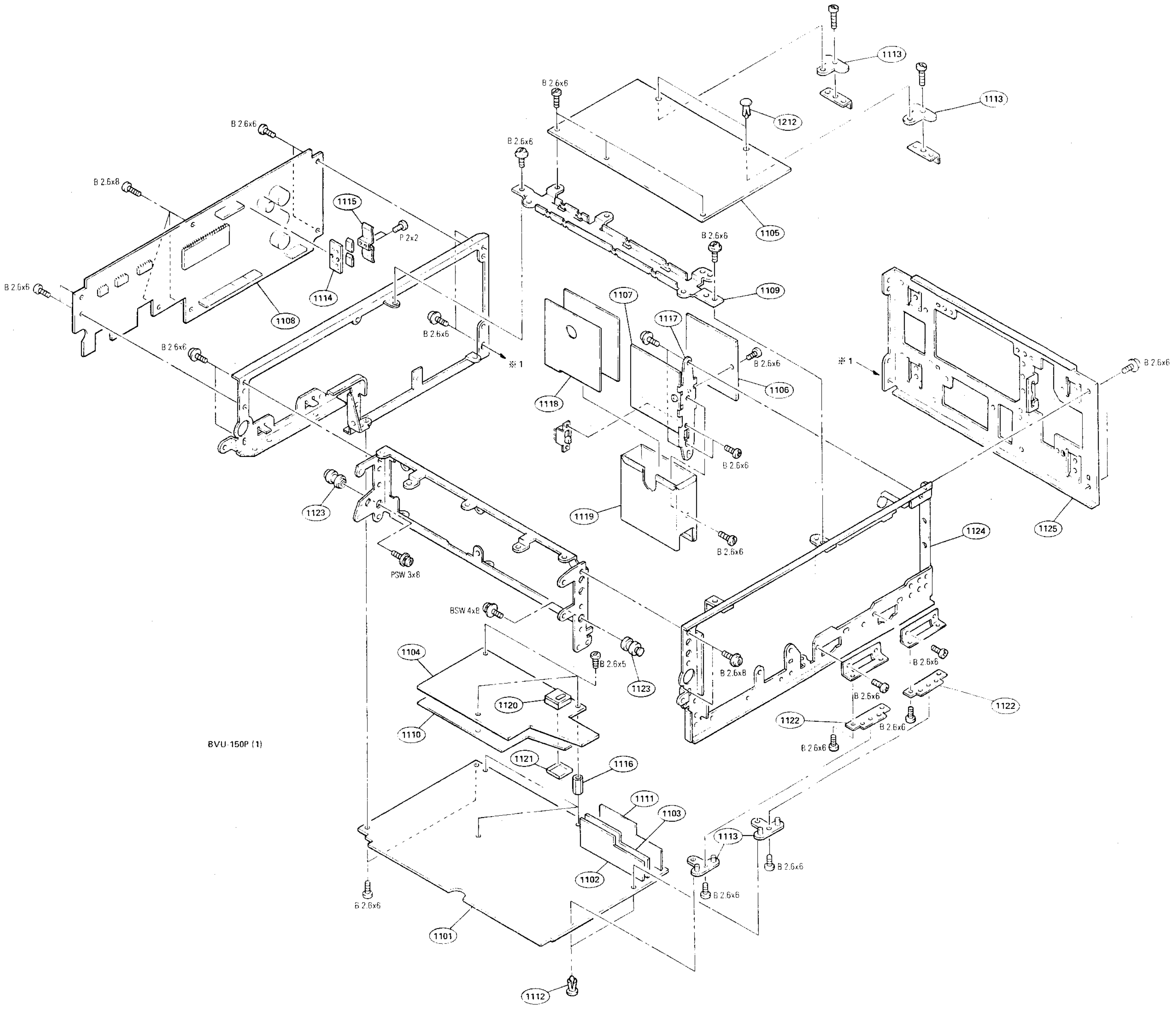
No.	Part No.	SP	Description
901	A-6751-200-A	s	CASSETTE COMPARTMENT ASSY
902	X-3657-049-0	o	RETAINER ASSY, C REEL
903	X-3685-826-2	o	HOLDER (L) ASSY, C
904	X-3685-832-2	o	GEAR ASSY, T
905	X-3685-834-1	o	ARM (LEFT LOWER) ASSY, C
906	X-3685-835-1	o	ARM (RIGHT LOWER) ASSY, C
907	X-3685-836-1	o	ARM (LEFT UPPER) ASSY, C
908	X-3685-837-1	o	ARM (RIGHT UPPER) ASSY, C
909	3-657-119-00	o	PLATE, RELEASE, (C) LID LOCK
910	3-657-120-04	o	ROLLER
911	3-657-195-00	o	SLEEVE, C
912	3-657-238-00	o	SPRING, TENSION
913	3-681-528-00	o	DAMPER
914	3-685-945-01	o	HOOK, SPRING, C
915	3-685-946-01	s	PIN, LOCK, LEVER, E
916	3-685-947-01	o	STAY (FRONT), C
917	3-685-948-01	o	STAY (REAR), C
918	3-685-949-01	o	RETAINER, SPRING
919	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
920	3-701-444-11	s	WASHER, POLY 6MM DIA., 0.25T

Connector Panel and Audio Board Blocks



No.	Part No.	SP	Description
1001	A-6713-232-A	o	MOUNTED CIRCUIT BOARD, AU-49A
1002	A-6713-233-A	o	MOUNTED CIRCUIT BOARD, AU-51A
1003	A-6713-234-A	o	MOUNTED CIRCUIT BOARD, CM-19A
1004	X-3685-862-1	o	COVER (B) ASSY, PROTECTION, AU
1005	X-3685-863-1	o	COVER (A) ASSY, PROTECTION, AU
1006	1-230-553-11	s	RES, VAR, CARBON 100K
1007	1-230-858-11	s	RES, VAR, CARBON 10K
1008	1-507-195-21	s	SPECIAL REMOTE CONTROL JACK
1009	1-509-176-31	s	RECEPTACLE, 3P
1010	1-509-184-31	s	RECEPTACLE, 3P
1011	1-561-040-00	s	RECEPTACLE, 14P (F)
1012	1-561-781-21	s	RECEPTACLE, BNC
1013	1-611-965-11	o	PRINTED CIRCUIT BOARD, DUS-6
1014	1-615-689-11	o	PRINTED CIRCUIT BOARD, DUS-69
1015	1-615-977-11	o	PRINTED CIRCUIT BOARD, DUS-70
1016	3-646-090-00	s	RIVET, NYLON
1017	3-682-919-00	o	SPACER (B), XLR
1018	3-686-040-01	s	HINGE
1019	3-687-924-01	o	SHEET, INSULATING, CM
1020	3-694-707-01	o	SPACER, AU PC BOARD
1021	3-694-710-01	o	SPACER, JM-25

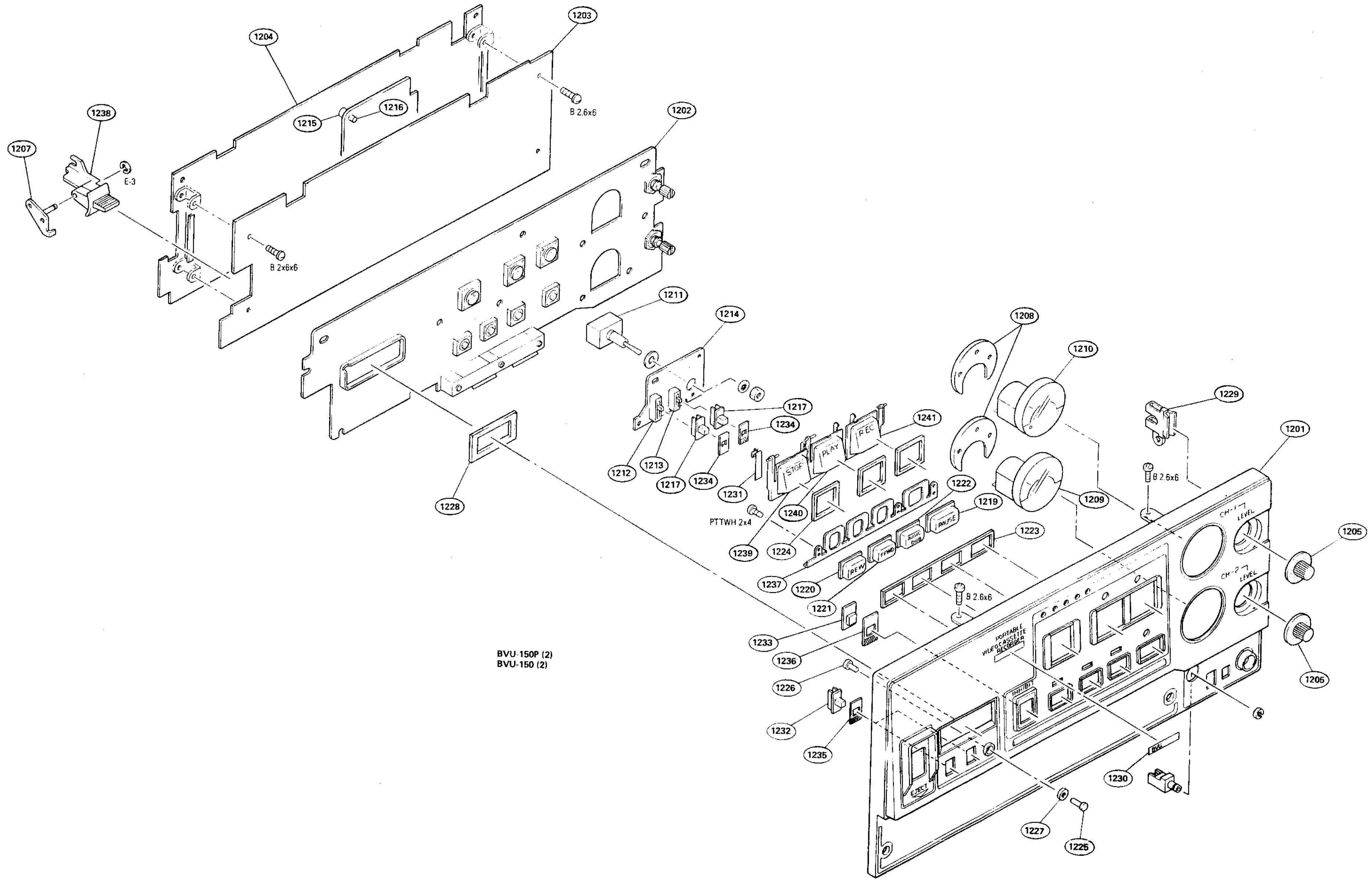
Printed Circuit Board and Frame Blocks



BVU-150P (1)

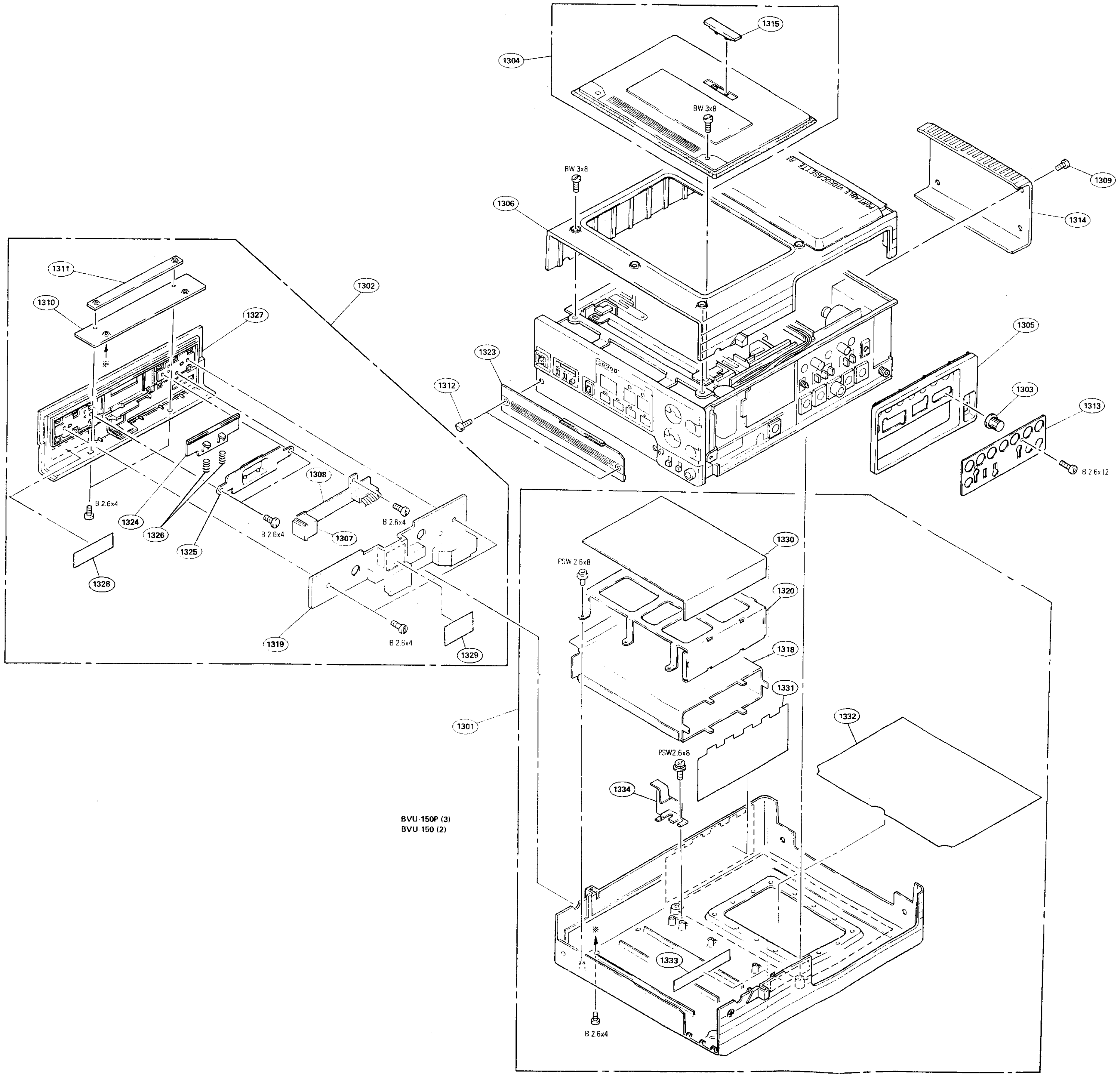
No.	Part No.	SP	Description
1101	A-6711-646-A	o	MOUNTED CITCUIT BOARD, VO-12
1102	A-6711-647-A	o	MOUNTED CIRCUIT BOARD, VA-29
1103	A-6711-648-A	o	MOUNTED CIRCUIT BOARD, BF-12
1104	A-6711-649-A	o	MOUNTED CIRCUIT BOARD, CR-26
1105	A-6711-651-A	o	MOUNTED CIRCUIT BOARD, YC-20
1106	A-6713-230-A	o	MOUNTED CIRCUIT BOARD, AU-64
1107	A-6713-231-A	o	MOUNTED CIRCUIT BOARD, AU-65
1108	A-6715-265-B	o	MOUNTED CIRCUIT BOARD, SV-57C
1109	A-6730-795-A	o	BEAM ASSY, UPPER
1110	X-3694-706-1	o	SHIELD ASSY, CR LOWER
1111	X-3694-708-1	o	PLATE ASSY, SHIELD, BF
1112	3-646-090-00	s	RIVET, NYLON
1113	3-657-153-00	o	HINGE
1114	3-686-055-01	o	HEAT SINK
1115	3-686-056-01	o	SPRING, LEAF
1116	3-694-708-01	o	SPACER, PC BOARD
1117	3-694-723-01	o	SPACER, NR
1118	3-694-731-01	o	SHEET, INSULATING, NR
1119	3-694-733-01	o	CASE, NR
1120	3-694-759-01	o	LID, CR SHIELD
1121	3-694-762-01	o	LID, REAR, CR SHIELD
1122	3-694-772-01	o	HOLDER, VO
1123	3-694-773-01	o	SUSPENSION (B)
1124	3-694-775-01	o	FRAME (B), R
1125	3-694-776-01	o	FRAME (B), REAR

Front Panel and Function Key Blocks



No.	Part No.	SP	Description
1201	A B C A-6704-186-~~B~~	o	PANEL SUB ASSY, FRONT
1202	A-6717-404-A	o	MOUNTED CIRCUIT BOARD, KY-86
1203	A-6717-405-A	o	MOUNTED CIRCUIT BOARD, SY-18C
1204	A-6717-406-A	o	MOUNTED CIRCUIT BOARD, SY-22A
1205	X-3694-702-1	s	KNOB (A) ASSY, VOL
1207	X-3694-704-1	o	HOLDER ASSY, E LEVER
1208	X-3694-705-1	o	CUSHION ASSY, METER
1209	1-520-482-11	s	METER, LEVEL
1210	1-520-482-21	s	METER, LEVEL
1211	1-553-246-00	s	SWITCH, TOGGLE
1212	1-554-075-00	s	SWITCH, SLIDE
1213	1-554-076-00	s	SWITCH, SLIDE
1214	1-615-967-11	o	PRINTED CIRCUIT BOARD, SWB-4
1215	3-659-487-00	s	HOLDER, BUZZER
1216	3-659-488-00	s	PIN, BUZZER HOLDER
1217	3-686-042-02	s	LEVER (C), SW
1219	3-698-909-01	s	KEY TOP, D "PAUSE"
1220	3-686-077-11	s	KEY TOP (A) "REW"
1221	3-686-077-21	s	KEY TOP (A) "FFWD"
1222	3-686-077-31	s	KEY TOP (A) "AUDIO DUB"
1223	3-686-082-01	o	SPACER (B)
1224	3-686-083-01	o	SPACER (A)
1225	3-686-084-01	s	PUSH BUTTON
1226	3-686-085-01	s	PIN, PUSH BUTTON
1227	3-686-086-01	s	CUSHION, BUTTON
1228	3-687-929-01	o	COVER, DUST, COUNTER
1229	3-687-930-01	o	PLATE, GROUND, RJ
1230	3-687-931-31	o	LABEL, F PANEL
1231	3-694-739-01	o	SPRING
1232	3-694-740-01	o	LEVER (E), SW
1233	3-694-742-01	o	LEVER (I), SLIDE
1234	3-694-743-11	o	PLATE (C), ORNAMENTAL, KNOB
1235	3-694-744-11	o	PLATE (D), ORNAMENTAL, KNOB
1236	3-694-746-01	o	PLATE, ORNAMENTAL
1237	3-694-748-01	o	SPRING
1238	3-694-756-01	o	BUTTON, E
1239	3-694-781-01	s	BUTTON, (A) "STOP"
1240	3-694-781-11	s	BUTTON, (A) "PLAY"
1241	3-694-782-01	s	BUTTON (B) "REC"

Ornamental Panel Block



No.	Part No.	SP	Description
1301	A-6703-551-B	o	CABINET (LOWER) ASSY
1302	A-6703-552-B	o	LID ASSY, BATTERY
1303	X-3685-857-1	s	KNOB ASSY, CP
1304	X-3694-701-1	s	COVER ASSY, C
1305	X-3694-707-1	o	ESCUTCHEON ASSY, CP
1306	X-3694-709-2	o	CABINET ASSY, UPPER
1307	1-507-626-00	s	JACK, POWER OUTSIDE
1308	1-615-976-11	o	PRINTED CIRCUIT BOARD, CN-26
1309	2-382-129-11	s	SCREW (M3x8), BW
1310	3-662-718-00	o	HINGE
1311	3-662-719-00	o	NUT, HINGE FITTING
1312	3-676-089-71	s	SCREW (4x13), LID
1313	3-694-712-01	o	PLATE, ORNAMENTAL, CP
1314	3-694-716-01	o	PANEL, REAR
1315	3-694-718-01	o	EMBLEM, U MATIC SP
1318	3-694-725-01	o	CASE, BATTERY
1319	3-694-726-02	o	COVER, B LID
1320	3-694-728-01	o	HOLDER, B CASE
1323	3-694-750-01	o	COVER (A), BK
1324	3-694-779-03	o	LEVER, BATTERY LOCK
1325	3-694-780-02	o	HOLDER, B LEVER
1326	3-849-356-00	s	SPRING, COIL
1327	X-3694-710-2	o	LID SUB ASSY, BATTERY
1328	3-678-782-00	o	LABEL, DOLBY (C)
1329	3-694-796-01	o	PLATE, INDICATION, BATTERY
1330	3-694-799-01	o	INSULATOR (BA)
1331	3-698-901-01	o	INSULATOR (LEFT)
1332	3-698-902-01	o	INSULATOR (LOWER)
1333	3-698-903-01	o	INSULATOR (RIGHT LOWER)
1334	3-698-904-01	o	PASS, HARNESS

17-3. ELECTRICAL PARTS LIST

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
C□□, CV□□	CAPACITOR	IC□□	IC	Q□□	TRANSISTOR
CF□□	CERAMIC FILTER	J□□	JACK	R□□, RV□□	RESISTOR
CN□□	CONNECTOR	L□□	INDUCTOR	RY□□	RELAY
D□□	DIODE	M□□	MOTOR	S□□, SW□□	SWITCH
DL□□	DELAY LINE	ME□□	METER	SB□□	SOLAR BATTERY
F□□	FUSE	MIC□□	MICROPHONE	T□□	TRANSFORMER
FB□□	FERRITE BEAD	PG□□	PG COIL	TH□□	THERMISTOR
FL□□	FILTER	PL□□	LAMP	X□□	CRYSTAL
H□□	HEAD	PM□□	SOLENOID		

All capacitors are in micro farads unless otherwise specified.

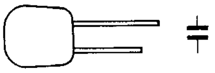
All inductors are in micro henries unless otherwise specified.

All resistors are in ohms.

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

CAPACITOR

SILVERED MICA CAPACITOR **1 pF through 620 pF ±5%, 50WV**

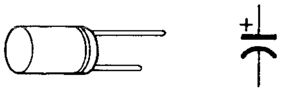


Parts No. 1-107-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 pF	098	15 pF	065	51 pF	078	180 pF	091
2	099	16	066	56	079	200	092
3	100	18	067	62	080	220	093
4	101	20	068	68	081	240	094
5	102	22	069	75	082	270	095
6	103	24	070	82	083	300	096
7	104	27	071	91	084	330	097
8	105	30	072	100	085	360	231
9	106	33	073	110	086	390	232
10	061	36	074	120	087	430	233
11	062	39	075	130	088	470	234
12	063	43	076	150	089	510	235
13	064	47	077	160	090	560	236
						620	237

ELECTROLYTIC CAPACITOR

0.1µF through 100µF ±20%
4WV through 50WV



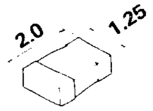
Parts No. 1-124-□□□-00

Value		Part No. −□□□−
0.1µF	50V	249
0.15	50	250
0.22	50	251
0.33	50	252
0.47	50	253
0.68	50	254
1	50	255
1.5	50	256
2.2	35	
	50	257
3.3	25	
	35	
	50	258
4.7	16	245

Value		Part No. −□□□−
4.7µF	25V	
	35	245
	50	259
6.8	10	
	16	
	25	239
	35	246
	50	260
10	6.3	
	10	
	16	233
	25	240
	35	247
	50	261

Value		Part No. −□□□−
22µF	6.3V	222
	10	
	16	234
	25	
	35	248
33	4	220
	6.3	
	10	229
	16	
	25	242
47	6.3	224
	10	
	16	236
100	6.3	225

CHIP CERAMIC CAPACITOR



220pF through 0.018µF(B) ± 10% 50WV
0.022µF through 0.068µF(F) $^{+80}_{-20}$% 50WV
0.1µF(F) $^{+80}_{-20}$% 25WV

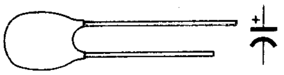
Parts No. 1-163-□□□-00

Value	Parts No. − □□□ −
100pF	—
120	—
150	—
180	—
220	001
270	002
330	003
390	004
470	005
560	006
680	007
820	008

Value	Parts No. − □□□ −
0.001µF	009
0.0012	010
0.0015	011
0.0018	012
0.0022	013
0.0027	014
0.0033	015
0.0039	016
0.0047	017
0.0056	018
0.0068	019
0.0082	020

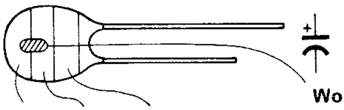
Value	Parts No. − □□□ −
0.01µF	021
0.012	022
0.015	023
0.018	024
0.022	033
0.027	—
0.033	034
0.039	—
0.047	035
0.056	—
0.068	036
0.082	—
0.1	038

TANTALUM CAPACITOR



0.01μF through 100μF ± 10%
3.15V through 35V

NOTE: The value of the parts that are marked by * in the below table are indicated by color code. (to the value with ±20%)



Working Voltage Color Code

Ex. BRN GRN BLU
1 5 6
15 x 10^6 pF = 15μF

BLK	RED	YEL	GRN	BLU	GRY	WHT
10V	35	6.3	16	20	25	3.15

Parts No. 1-131-□□□-00

Value		Parts No. —□□□—
0.01μ	35V	*396
0.015	35	*397
0.022	35	*398
0.033	35	*399
0.047	35	*400
0.068	35	*401
0.1	35	341
0.15	35	342
0.22	35	343
0.33	25	*409
	35	344
0.47	20	*412
	35	345
0.68	16	*415
	25	*410
	35	346
1.0	10	*418
	25	498

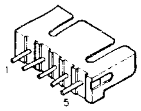
Value		Parts No. —□□□—
1.0μ	35V	347
1.5	6.3	*421
	20	499
	25	354
	35	348
2.2	3.15	*424
	16	500
	20	361
	25	355
	35	349
3.3	10	501
	16	368
	20	362
	25	356
	35	350
4.7	6.3	502
	10	375
	16	369

Value		Parts No. —□□□—
4.7μ	20V	363
	25	357
	35	351
6.8	3.15	503
	6.3	382
	10	376
	16	370
	20	364
	25	358
	35	352
10	3.15	389
	6.3	383
	10	377
	16	371
	20	365
	25	359
	35	353
15	3.15	390
	6.3	384

Value		Parts No. —□□□—
15μ	10V	378
	16	372
	20	366
	25	360
22	3.15	391
	6.3	385
	10	379
	16	373
	20	367
33	3.15	392
	6.3	386
	10	380
	16	374
47	3.15	393
	6.3	387
	10	381
68	3.15	394
	6.3	388
100	3.15	395

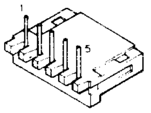
CONNECTOR

top-type receptacle



2P	1-564-001-11
3P	002-00
4P	003-00
5P	004-00
6P	005-00
7P	006-11
8P	007-00
9P	008-00
10P	009-00
11P	010-11
12P	011-11
13P	
14P	069-00
15P	

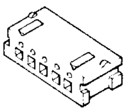
side-type receptacle



2P	1-564-012-00
3P	013-00
4P	014-00
5P	015-00
6P	016-00
7P	017-00
8P	018-11
9P	019-11
10P	020-00
11P	021-11
12P	022-00
13P	
14P	
15P	

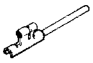
plug

housing



2P	1-562-147-11
3P	148-11
4P	149-11
5P	150-11
6P	151-11
7P	152-11
8P	153-11
9P	154-11
10P	155-11
11P	156-11
12P	157-11
13P	
14P	185-00
15P	

contact

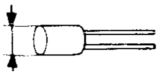


1-564-026-21

INDUCTOR

MICRO INDUCTOR

1 μH through 470 μH
±5%



Parts No. 1-407-□□□-XX

Value	Parts No. –□□□–
1 μH	178
1.2	179
1.5	180
1.8	181
2.2	182
2.7	183
3.3	184
3.9	185

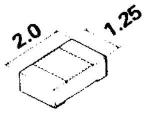
Value	Parts No. –□□□–
4.7 μH	186
5.6	187
6.8	188
8.2	189
10	157
12	158
15	159
18	160

Value	Parts No. –□□□–
22 μH	161
27	162
33	163
39	164
47	165
56	166
68	167
82	168

Value	Parts No. –□□□–
100 μH	169
120	170
150	171
180	172
220	173
270	174
330	175
390	176
470	177

RESISTOR

CHIP RESISTOR



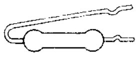
±5% 1/10W
0Ω through 3.3MΩ

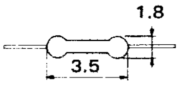
Parts No. 1-216-□□□-00

Value	Parts No. — □□□ —
0Ω	295
1Ω	—
1.1	—
1.2	—
1.3	—
1.5	—
1.6	—
1.8	—
2	—
2.2	298
2.4	301
2.7	302
3	303
3.3	304
3.6	305
3.9	306
4.3	307
4.7	308
5.1	297
5.6	309
6.2	310
6.8	311
7.5	312
8.2	313
9.1	314
10Ω	001
11	002
12	003
13	004
15	005
16	006
18	007
20	008
22	009
24	010
27	011
30	012
33Ω	013
36	014
39	015
43	016
47	017
51	018
56	019
62	020
68	021
75	022
82	023
91	024
100Ω	025
110	026
120	027
130	028
150	029
160	030
180	031
200	032
220	033
240	034
270	035
300	036
330	037
360	038
390	039
430	040
470	041
510	042
560	043
620	044
680	045
750	046
820	047
910	048
1kΩ	049
1.1	050
1.2	051
1.3	052
1.5	053
1.6	054
1.8	055
2	056
2.2	057
2.4	058
2.7	059
3	060
3.3	061
3.6	062
3.9	063
4.3	064
4.7	065
5.1	066
5.6	067
6.2	068
6.8	069
7.5	070
8.2	071
9.1	072
10kΩ	073
11	074
12	075
13	076
15	077
16	078
18	079
20	080
22	081
24	082
27	083
30	084
33kΩ	085
36	086
39	087
43	088
47	089
51	090
56	091
62	092
68	093
75	094
82	095
91	096
100kΩ	097
110	098
120	099
130	100
150	101
160	102
180	103
200	104
220	105
240kΩ	106
270	107
300	108
330	109
360	110
390	111
430	112
470	113
510	114
560	115
620	116
680	117
750	118
820	119
910	120
1MΩ	121
1.1	122
1.2	123
1.3	124
1.5	125
1.6	126
1.8	127
2	128
2.2	129
2.4	130
2.7	131
3	132
3.3	133

CARBON RESISTOR (1/6W)

±5%, 1/6W, non-special type
2.2Ω through 1MΩ





Parts No. 1-247-□□□-00

Value	Parts No. —□□□—	Value	Parts No. —□□□—	Value	Parts No. —□□□—	Value	Parts No. —□□□—
1Ω	–	36Ω	796	1.2kΩ	833	43kΩ	870
1.1	–	39	797	1.3	834	47	871
1.2	–	43	798	1.5	835	51	872
1.3	–	47	799	1.6	836	56	873
1.5	–	51	800	1.8	837	62	874
1.6	–	56	801	2	838	68	875
1.8	–	62	802	2.2	839	75	876
2	–	68	803	2.4	840	82	877
2.2	767	75	804	2.7	841	91	878
2.4	768	82	805	3	842	100kΩ	879
2.7	769	91	806	3.3	843	110	880
3	770	100Ω	807	3.6	844	120	881
3.3	771	110	808	3.9	845	130	882
3.6	772	120	809	4.3	846	150	883
3.9	773	130	810	4.7	847	160	884
4.3	774	150	811	5.1	848	180	885
4.7	775	160	812	5.6	849	200	886
5.1	776	180	813	6.2	850	220	887
5.6	777	200	814	6.8	851	240	888
6.2	778	220	815	7.5	852	270	889
6.8	779	240	816	8.2	853	300	890
7.5	780	270	817	9.1	854	330	891
8.2	781	300	818	10kΩ	855	360	892
9.1	782	330	819	11	856	390	893
10Ω	783	360	820	12	857	430	894
11	784	390	821	13	858	470	895
12	785	430	822	15	859	510	896
13	786	470	823	16	860	560	897
15	787	510	824	18	861	620	898
16	788	560	825	20	862	680	899
18	789	620	826	22	863	750	900
20	790	680	827	24	864	820	901
22	791	750	828	27	865	910	902
24	792	820	829	30	866	1MΩ	903
27	793	910	830	33	867		
30	794	1kΩ	831	36	868		
33	795	1.1	832	39	869		

Ref.No.	Parts No.	SP	Description
AU-49A BOARD			
	A-6713-232-A	o	MOUNTED CIRCUIT BOARD,AU-49A
C101	1-109-683-00	s	MICA 270PF 5% 500V
C102	1-123-332-00	s	ELECT 47 20% 16V
C103	1-163-259-00	s	CERAMIC CHIP 220PF 5% 50V
C105	1-130-487-00	s	MYLAR 0.022 5% 50V
C118	1-130-491-00	s	MYLAR 0.047 5% 50V (S/N:up to 10190)
C118	1-136-164-00	s	MYLAR 0.082 5% 50V (S/N:10191 and higher)
C120	1-102-116-00	s	CERAMIC 680PF 10% 50V
C125	1-123-321-00	s	ELECT 220 20% 16V
C128	1-163-259-00	s	CERAMIC CHIP 220PF 5% 50V
C129	1-123-321-00	s	ELECT 220 20% 16V
C135	1-163-259-00	s	CERAMIC 220PF 5% 50V
C150	1-163-251-00	s	CERAMIC CHIP 100PF 5% 50V
C160	1-163-235-00	s	CERAMIC CHIP 22PF 5% 50V
C161	1-163-235-00	s	CERAMIC CHIP 22PF 5% 50V
C201	1-109-683-00	s	MICA 270PF 1% 500V
C202	1-123-332-00	s	ELECT 47 20% 16V
C203	1-163-259-00	s	CERAMIC CHIP 220PF 5% 50V
C204	1-130-476-00	s	MYLAR 0.0027 5% 50V
C205	1-130-487-00	s	MYLAR 0.022 5% 50V
C218	1-130-491-00	s	MYLAR 0.047 5% 50V (S/N:up to 10190)
C218	1-136-164-00	s	MYLAR 0.082 5% 50V (S/N:10191 and higher)
C220	1-102-116-00	s	CERAMIC 680PF 10% 50V
C225	1-123-321-00	s	ELECT 220 20% 16V
C228	1-163-259-00	s	CERAMIC CHIP 220PF 5% 50V
C229	1-123-321-00	s	ELECT 220 20% 16V
C235	1-163-259-00	s	CERAMIC 220PF 5% 50V
C240	1-130-487-00	s	MYLAR 0.022 5% 50V
C250	1-163-251-00	s	CERAMIC CHIP 100PF 5% 50V
C260	1-163-235-00	s	CERAMIC CHIP 22PF 5% 50V
C261	1-163-235-00	s	CERAMIC CHIP 22PF 5% 50V
C301	1-124-445-00	s	ELECT 100 20% 16V
C316	1-124-445-00	s	ELECT 100 20% 16V
C322	1-124-468-11	s	ELECT 100 20% 6.3V
C355	1-130-472-00	s	MYLAR 0.0012 5% 50V
D101	8-719-100-05	s	1S2837
D104	8-719-100-05	s	1S2837
D105	8-719-101-23	s	1SS123
D201	8-719-100-05	s	1S2837
D301	8-719-191-07	s	RD9.1E
D302	8-719-151-07	s	RD5.1E-B
D303	8-719-101-23	s	1SS123
D304	8-719-911-19	s	1SS119
D306	8-719-911-19	s	1SS119
D307	8-719-911-19	s	1SS119
D308	8-719-100-05	s	1S2837
D309	8-719-911-19	s	1SS119
D310	8-719-911-19	s	1SS119
D312	8-719-911-19	s	1SS119
D320	8-719-911-19	s	1SS119
D323	8-719-100-03	s	1S2835
FL1	8-749-925-15	s	AFL25F15000G1(MURATA) (S/N:up to 10190)
FL2	8-749-925-15	s	AFL25F15000G1(MURATA) (S/N:up to 10190)
FL1	8-741-134-32	s	BX1343A(SONY) (S/N:10191 and higher)
FL2	8-741-134-32	s	BX1343A(SONY) (S/N:10191 and higher)

Ref.No.	Parts No.	SP	Description
IC101	8-759-700-09	s	NJM2043M-D(JRC)
IC102	8-759-200-81	s	TC4053BF(TOSHIBA)
IC103	8-759-700-84	s	NJM2041M-D(JRC)
IC104	8-759-700-84	s	NJM2041M-D(JRC)
IC105	8-759-905-42	s	NE5534P(TI)
IC106	8-759-905-42	s	NE5534P(TI)
IC202	8-759-200-81	s	TC4053BF(TOSHIBA)
IC203	8-759-700-84	s	NJM2041M-D(JRC)
IC204	8-759-700-84	s	NJM2041M-D(JRC)
IC205	8-759-905-42	s	NE5534P(TI)
IC206	8-759-905-42	s	NE5534P(TI)
IC301	8-759-745-64	s	NJM4560M(JRC)
LV101	1-459-411-00	s	VAR,18mH
LV102	1-459-434-00	s	VAR,22mH
LV103	1-459-411-00	s	VAR,18mH
LV201	1-459-411-00	s	VAR,18mH
LV202	1-459-434-00	s	VAR,22mH
LV203	1-459-411-00	s	VAR,18mH
LV204	1-459-434-00	s	VAR,22mH
Q101	8-729-178-55	s	2SC2785-E
Q102	8-729-178-55	s	2SC2785-E
Q103	8-729-400-76	s	2SD1030
Q104	8-729-100-66	s	2SC1623
Q105	8-729-901-01	s	DTC144EK
Q106	8-729-100-66	s	2SC1623
Q107	8-729-901-01	s	DTC144EK
Q108	8-729-100-66	s	2SC1623
Q110	8-729-178-55	s	2SC2785-E
Q111	8-729-178-55	s	2SC2785-E
Q112	8-729-400-76	s	2SD1030
Q113	8-729-100-66	s	2SC1623
Q114	8-729-400-76	s	2SD1030
Q115	8-729-100-66	s	2SC1623
Q116	8-729-100-66	s	2SC1623
Q120	8-729-400-76	s	2SD1030
Q123	8-729-400-76	s	2SC1030
Q133	8-729-400-76	s	2SC1030
Q136	8-729-400-76	s	2SC1030
Q201	8-729-178-55	s	2SC2785-E
Q202	8-729-178-55	s	2SC2785-E
Q203	8-729-400-76	s	2SD1030
Q204	8-729-100-66	s	2SC1623
Q205	8-729-901-01	s	DTC144EK
Q206	8-729-100-66	s	2SC1623
Q207	8-729-901-01	s	DTC144EK
Q208	8-729-100-66	s	2SC1623
Q210	8-729-178-55	s	2SC2785-E
Q211	8-729-178-55	s	2SC2785-E
Q212	8-729-400-76	s	2SD1030
Q213	8-729-100-66	s	2SC1623
Q214	8-729-400-76	s	2SD1030
Q215	8-729-100-66	s	2SC1623
Q216	8-729-100-66	s	2SC1623
Q217	8-729-901-01	s	DTC144EK

Ref.No.	Parts No.	SP	Description
Q220	8-729-400-76	s	2SD1030
Q223	8-729-400-76	s	2SD1030
Q224	8-729-901-01	s	DTC144EK
Q225	8-729-901-06	s	DTA144EK
Q233	8-729-400-76	s	2SD1030
Q236	8-729-400-76	s	2SD1030
Q301	8-729-901-01	s	DTC144EK
Q302	8-729-905-52	s	2SD1055
Q303	8-729-100-66	s	2SC1623
Q304	8-729-100-76	s	2SA812
Q305	8-729-100-66	s	2SC1623
Q306	8-729-178-55	s	2SC2785-E
Q307	8-729-100-66	s	2SC1623
Q308	8-729-100-66	s	2SC1623
Q309	8-729-901-01	s	DTC144EK
Q310	8-729-901-01	s	DTC144EK
Q311	8-729-100-76	s	2SA812
Q312	8-729-100-76	s	2SA812
Q313	8-729-100-66	s	2SC1623
Q314	8-729-100-76	s	2SA812
Q315	8-729-100-76	s	2SA812
Q316	8-729-982-22	s	2SB822
Q317	8-729-905-52	s	2SD1055
Q318	8-729-901-01	s	DTC144EK
Q325	8-729-901-01	s	DTC144EK
Q326	8-729-901-01	s	DTC144EK
Q327	8-729-901-01	s	DTC144EK
Q328	8-729-901-01	s	DTC144EK
Q330	8-729-100-66	s	2SC1623
R155	1-215-433-00	s	METAL 3.3k 1% 1/6W
R156	1-215-433-00	s	METAL 3.3k 1% 1/6W
R161	1-215-445-00	s	METAL 10k 1% 1/6W
R165	1-215-389-00	s	METAL 47 1% 1/6W
R167	1-215-445-00	s	METAL 10k 1% 1/6W
R170	1-215-433-00	s	METAL 3.3k 1% 1/6W
R171	1-215-433-00	s	METAL 3.3k 1% 1/6W
R173	1-215-445-00	s	METAL 10k 1% 1/6W
R176	1-215-445-00	s	METAL 10k 1% 1/6W
R180	1-215-389-00	s	METAL 47 1% 1/6W
R182	1-215-445-00	s	METAL 10k 1% 1/6W
R212	1-215-475-00	s	METAL 180k 1% 1/6W
R255	1-215-433-00	s	METAL 3.3k 1% 1/6W
R256	1-215-433-00	s	METAL 3.3k 1% 1/6W
R261	1-215-445-00	s	METAL 10k 1% 1/6W
R265	1-215-389-00	s	METAL 47 1% 1/6W
R267	1-215-445-00	s	METAL 10k 1% 1/6W
R270	1-215-433-00	s	METAL 3.3k 1% 1/6W
R271	1-215-433-00	s	METAL 3.3k 1% 1/6W
R273	1-215-445-00	s	METAL 10k 1% 1/6W
R276	1-215-445-00	s	METAL 10k 1% 1/6W
R280	1-215-389-00	s	METAL 47 1% 1/6W
R282	1-215-445-00	s	METAL 10k 1% 1/6W
RV102	1-228-890-00	s	VAR,METAL 4.7k
RV103	1-228-891-00	s	VAR,METAL 10k
RV104	1-228-890-00	s	VAR,METAL 4.7k
RV105	1-228-461-00	s	VAR,CERMET 50k
RV106	1-228-890-00	s	VAR,METAL 4.7k
RV107	1-228-890-00	s	VAR,METAL 4.7k
RV108	1-228-889-00	s	VAR,METAL 2.2k
RV201	1-228-891-00	s	VAR,METAL 10k
RV202	1-228-890-00	s	VAR,METAL 4.7k
RV203	1-228-891-00	s	VAR,METAL 10k
RV204	1-228-890-00	s	VAR,METAL 4.7k
RV205	1-228-461-00	s	VAR,CERMET 50k
RV206	1-228-890-00	s	VAR,METAL 4.7k
RV207	1-228-890-00	s	VAR,METAL 4.7k
RV208	1-228-889-00	s	VAR,METAL 2.2k
RV302	1-228-473-00	s	VAR,CERMET 5k
RV303	1-228-473-00	s	VAR,CERMET 5k

AU-51A BOARD

This board includes the DUS-3 board.

	A-6713-233-A	o	MOUNTED CIRCUIT BOARD,AU-51A
C101	1-131-420-00	s	TANTALUM 4.7 20% 10V
C103	1-131-419-00	s	TANTALUM 2.2 20% 10V
C106	1-131-420-00	s	TANTALUM 4.7 20% 10V
C201	1-131-420-00	s	TANTALUM 4.7 20% 10V
C203	1-131-419-00	s	TANTALUM 2.2 20% 10V
C206	1-131-420-00	s	TANTALUM 4.7 20% 10V
C304	1-131-422-00	s	TANTALUM 3.3 20% 6.3V
C305	1-131-411-00	s	TANTALUM 1.5 20% 25V
C306	1-124-462-00	s	ELECT 10 20% 16V
C307	1-162-541-00	s	CERAMIC CHIP 470PF 5% 100V
C308	1-162-542-00	s	CERAMIC CHIP 680PF 5% 100V
C309	1-162-540-00	s	CERAMIC CHIP 0.0015 5% 100V
CN435	1-564-317-00	o	BOARD TO BOARD, 5P
CP301	1-404-372-11	s	OSCILLATOR BLOCK,BIAS
D101	8-719-100-05	s	1S2837
D102	8-719-100-03	s	1S2835
D201	8-719-100-05	s	1S2837
D202	8-719-100-03	s	1S2835
D301	8-719-191-07	s	RD9.1E
D302	8-719-110-07	s	RD10E
D303	8-719-100-05	s	1S2837
Q101	8-729-100-76	s	2SA812
Q102	8-729-100-66	s	2SC1623
Q103	8-729-100-66	s	2SC1623
Q104	8-729-100-66	s	2SC1623
Q105	8-729-100-66	s	2SC1623

Ref.No.	Parts No.	SP	Description
Q106	8-729-100-66	s	2SC1623
Q107	8-729-100-76	s	2SA812
Q108	8-729-100-66	s	2SC1623
Q109	8-729-100-66	s	2SC1623
Q110	8-729-100-76	s	2SA812
Q201	8-729-100-76	s	2SA812
Q202	8-729-100-66	s	2SC1623
Q203	8-729-100-66	s	2SC1623
Q204	8-729-100-66	s	2SC1623
Q205	8-729-100-66	s	2SC1623
Q206	8-729-100-66	s	2SC1623
Q207	8-729-100-76	s	2SA812
Q208	8-729-100-66	s	2SC1623
Q209	8-729-100-66	s	2SC1623
Q210	8-729-100-76	s	2SA812
Q301	8-729-901-06	s	DTA144EK
Q302	8-729-982-22	s	2SB822
Q303	8-729-982-22	s	2SB822
Q304	8-729-100-66	s	2SC1623
Q305	8-729-901-01	s	DTC144EK
Q306	8-729-905-52	s	2SD1055
RV101	1-228-895-00	s	VAR,METAL 100k
RV201	1-228-895-00	s	VAR,METAL 100k
RV301	1-228-894-00	s	VAR,METAL 47k
RY1	1-515-475-00	s	12V,360ohm

AU-64 BOARD

This board includes the DUS-94 board.

Ref.No.	Parts No.	SP	Description
	A-6713-230-A	o	MOUNTED CIRCUIT BOARD, AU-64
	1-564-317-00	o	BOARD TO BOARD, 5P
C101	1-130-484-00	s	MYLAR 0.012 5% 50V
C102	1-130-488-00	s	MYLAR 0.027 5% 50V
C103	1-130-484-00	s	MYLAR 0.012 5% 50V
C104	1-130-489-00	s	MYLAR 0.033 5% 50V
C105	1-130-486-00	s	MYLAR 0.018 5% 50V
C106	1-130-486-00	s	MYLAR 0.018 5% 50V
C123	1-136-164-00	s	MYLAR 0.082 5% 50V
C126	1-136-164-00	s	MYLAR 0.082 5% 50V
CN441	1-562-480-11	o	10P
IC101	8-759-700-84	s	NJM2041M-D(JRC)
IC102	8-749-925-15	s	AFL25F15000G1(MURATA)
IC103	8-741-115-20	s	BX1152(SONY)
IC104	8-759-745-64	s	NJM4560M(JRC)
IC105	8-759-745-64	s	NJM4560M(JRC)
IC106	8-759-745-64	s	NJM4560M(JRC)
IC107	8-759-205-78	s	TC504013BF(TOSHIBA)
IC108	8-759-200-81	s	TC4053BF(TOSHIBA)
IC109	8-759-200-81	s	TC4053BF(TOSHIBA)
LV101	1-459-434-00	s	VAR,22mH
Q101	8-729-400-76	s	2SD1030
Q102	8-729-901-06	s	DTC144EK
Q103	8-729-901-06	s	DTC144EK
Q104	8-729-901-06	s	DTC144EK
Q105	8-729-901-06	s	DTC144EK
RV101	1-228-474-00	s	VAR,CERMET 10k

AU-65 BOARD

This board includes the DUS-94 board.

Ref.No.	Parts No.	SP	Description
	A-6713-231-A	o	MOUNTED CIRCUIT BOARD, AU-65
	1-564-317-00	o	BOARD TO BOARD, 5P
C201	1-130-484-00	s	MYLAR 0.012 5% 50V
C202	1-130-488-00	s	MYLAR 0.027 5% 50V
C203	1-130-484-00	s	MYLAR 0.012 5% 50V
C204	1-130-489-00	s	MYLAR 0.033 5% 50V
C205	1-130-486-00	s	MYLAR 0.018 5% 50V
C206	1-130-486-00	s	MYLAR 0.018 5% 50V
CN461	1-564-490-11	o	10P
IC201	8-759-700-84	s	NJM2041M-D(JRC)
IC202	8-749-925-15	s	AFL25F15000G1(MURATA)
IC203	8-741-115-20	s	BX1152(SONY)
IC204	8-759-745-64	s	NJM4560M(JRC)
IC205	8-759-745-64	s	NJM4560M(JRC)
IC208	8-759-200-81	s	TC4053BF(TOSHIBA)
IC209	8-759-200-81	s	TC4053BF(TOSHIBA)
LV201	1-459-434-00	s	VAR,22mH

Ref.No.	Parts No.	SP	Description
Q201	8-729-400-76	s	2SD1030
Q202	8-729-901-01	s	DTC144EK
Q203	8-729-901-01	s	DTC144EK
Q204	8-729-400-76	s	2SD1030
Q205	8-729-905-52	s	2SD1055
Q206	8-729-982-22	s	2SB822
RV201	1-228-474-00	s	CERMET 10k

BF-12 BOARD

Ref.No.	Parts No.	SP	Description
	A-6711-648-A	o	MOUNTED CIRCUIT BOARD, BF-12
C9	1-161-461-00	s	CERAMIC 150PF 5% 50V
CN51	1-562-639-11	o	10P
CN52	1-562-639-11	o	10P
D1	8-719-911-19	s	1SS119
D2	8-719-911-19	s	1SS119
D3	8-719-911-19	s	1SS119
D4	8-719-911-19	s	1SS119
IC1	8-752-006-00	s	CX20060(SONY)
IC2	8-759-324-11	s	HA12411(HITACHI)
IC3	8-759-240-53	s	TC4053BP(TOSHIBA)
Q1	8-729-271-22	s	2SC2712G
Q2	8-729-271-22	s	2SC2712G
Q3	8-729-271-22	s	2SC2712G
Q4	8-729-216-22	s	2SA1162
Q5	8-729-603-50	s	2SC403SP
Q6	8-729-603-50	s	2SC403SP
Q7	8-729-271-22	s	2SC2712G
R11	1-215-428-00	s	METAL 2k 1% 1/6W
R18	1-215-422-00	s	METAL 1.1k 1% 1/6W
R20	1-215-432-00	s	METAL 3K 1% 1/6W
R23	1-215-436-00	s	METAL 4.3k 1% 1/6W
R35	1-215-404-00	s	METAL 200 1% 1/6W
R36	1-215-394-00	s	METAL 75 1% 1/6W
RV1	1-228-518-00	s	VAR,METAL 1k

CM-19A BOARD

Ref.No.	Parts No.	SP	Description
	A-6713-234-A	o	MOUNTED CIRCUIT BOARD,CM-19A
C10	1-163-251-00	o	CERAMIC CHIP 100PF 5% 50V
C11	1-163-251-00	o	CERAMIC CHIP 100PF 5% 50V
C52	1-124-462-00	s	ELECT 10 20% 16V
IC1	8-759-700-84	s	NJM2041M-D(JRC)
IC2	8-759-700-84	s	NJM2041M-D(JRC)
IC3	8-759-700-84	s	NJM2041M-D(JRC)
IC51	8-759-700-84	s	NJM2041M-D(JRC)
IC52	8-759-700-84	s	NJM2041M-D(JRC)
L1	1-407-519-00	s	8uH
L2	1-407-519-00	s	8uH
L51	1-407-519-00	s	8uH
L52	1-407-519-00	s	8uH
Q1	8-729-901-01	s	DTC144EK
R9	1-215-437-00	s	METAL 4.7k 1% 1/6W
R10	1-215-403-00	s	METAL 180 1% 1/6W
R13	1-215-403-00	s	METAL 180 1% 1/6W
R14	1-215-437-00	s	METAL 4.7k 1% 1/6W
R16	1-215-437-00	s	METAL 4.7k 1% 1/6W
R17	1-215-437-00	s	METAL 4.7k 1% 1/6W
R60	1-215-403-00	s	METAL 180 1% 1/6W
R63	1-215-437-00	s	METAL 4.7k 1% 1/6W
R66	1-215-403-00	s	METAL 180 1% 1/6W
R67	1-215-437-00	s	METAL 4.7k 1% 1/6W
R68	1-215-437-00	s	METAL 4.7k 1% 1/6W
R69	1-215-437-00	s	METAL 4.7k 1% 1/6W
RV1	1-228-457-00	s	VAR,CERMET 2k
RV51	1-228-457-00	s	VAR,CERMET 2k
S1	1-554-970-11	s	SLIDE "CH-1 MIC/LINE"
S2	1-554-972-11	s	SLIDE "-20dB/-60dB CAMERA INPUT LEVEL"
S3	1-554-971-11	s	SLIDE "CH-2 MIC/CAMERA/LINE"
S5	1-554-971-11	s	SLIDE "MONITOR"

CN-26 BOARD

Ref.No.	Parts No.	SP	Description
	1-615-976-11	o	PRINTED CIRCUIT BOARD,CN-26
C1	1-161-059-00	s	CERAMIC 0.047 50V 10%

CN-100 BOARD

Ref.No.	Parts No.	SP	Description
	1-615-979-11	o	PRINTED CIRCUIT BOARD,CN-100
C1	1-125-393-11	s	ELECT 0.47F 5.5V

CR-26 BOARD

Ref.No.	Parts No.	SP	Description
	A-6711-649-A	o	MOUNTED CIRCUIT BOARD,CR-26
C1	1-130-479-00	s	MYLAR 0.0047 5% 50V
C2	1-130-481-00	s	MYLAR 0.0068 5% 50V
C4	1-130-478-00	s	MYLAR 0.0039 5% 50V
C7	1-130-481-00	s	MYLAR 0.0068 5% 50V
C9	1-130-471-00	s	MYLAR 0.001 5% 50V
C11	1-130-471-00	s	MYLAR 0.001 5% 50V
C15	1-124-584-00	s	ELECT 100 20% 10V
C22	1-130-483-00	s	MYLAR 0.01 5% 50V
C24	1-130-478-00	s	MYLAR 0.0039 5% 50V
C26	1-130-471-00	s	MYLAR 0.001 5% 50V
C28	1-107-211-00	s	MICA 24PF 5% 500V
	(S/N:up to 10020)		
C28	1-107-049-00	s	MICA 8.2PF 0.5PF 500V
	(S/N:10021 and higher)		
C35	1-130-483-00	s	MYLAR 0.01 5% 50V
C37	1-107-159-00	s	MICA 33PF 5% 500V
C39	1-107-202-00	s	MICA 10PF 5% 500V
C50	1-102-759-00	s	CERAMIC 62PF 5% 50V
C63	1-130-487-00	s	MYLAR 0.022 5% 50V
C70	1-124-445-00	s	ELECT 100 20% 16V
C71	1-130-471-00	s	MYLAR 0.001 5% 50V
CN22	1-564-492-11	s	20P
D1	8-719-100-05	s	1S2837
D3	8-719-815-59	s	1S1555
D4	8-719-915-43	s	FC54M
D5	8-719-815-59	s	1S1555
D6	8-719-100-05	s	1S2837
D7	8-719-101-98	s	1SS97
D8	8-719-101-98	s	1SS97
DL1	1-415-402-11	s	300nS(1.0MHz)
FL1	1-231-377-21	s	BAND PASS
FL2	1-235-476-11	s	BAND PASS
FL3	1-235-471-11	s	LOW PASS
IC1	8-759-908-59	s	CX859(SONY)
IC2	8-750-000-46	s	CX872(SONY)
IC3	8-741-126-40	s	BX1264(SONY)
IC4	8-752-006-10	s	CX20061(SONY)
IC5	8-741-125-10	s	BX1251(SONY)
IC6	8-759-200-81	s	TC4053BF(TOSHIBA)
IC7	8-741-126-20	s	BX1262(SONY)
IC8	8-752-006-10	s	CX20061(SONY)
L4	1-407-746-00	s	47uH
LV1	1-407-572-00	s	VAR,33uH

Ref.No.	Parts No.	SP	Description
Q1	8-729-271-23	s	2SC2712
Q2	8-729-271-23	s	2SC2712
Q3	8-729-216-22	s	2SA1162
Q4	8-729-216-22	s	2SA1162
Q5	8-729-271-23	s	2SC2712
Q6	8-729-271-23	s	2SC2712
Q8	8-729-271-23	s	2SC2712
Q9	8-729-271-23	s	2SC2712
Q10	8-729-271-23	s	2SC2712
Q11	8-729-216-22	s	2SA1162
Q12	8-729-271-23	s	2SC2712
Q14	8-729-400-76	s	2SD1030
	(S/N:10191 and higher)		
R5	1-215-428-00	s	METAL 2k 1% 1/6W
R20	1-215-436-00	s	METAL 4.3k 1% 1/6W
R25	1-215-490-00	s	METAL 750k 1% 1/6W
R30	1-215-449-00	s	METAL 15k 1% 1/6W
R31	1-215-459-00	s	METAL 39k 1% 1/6W
R39	1-215-438-00	s	METAL 5.1k 1% 1/6W
R40	1-215-438-00	s	METAL 5.1k 1% 1/6W
R52	1-215-466-00	s	METAL 75k 1% 1/6W
R53	1-215-432-00	s	METAL 3k 1% 1/6W
R54	1-215-452-00	s	METAL 20k 1% 1/6W
R56	1-215-414-00	s	METAL 510 1% 1/6W
R57	1-215-414-00	s	METAL 510 1% 1/6W
R65	1-215-474-00	s	METAL 160k 1% 1/6W
R83	1-215-490-00	s	METAL 750k 1% 1/6W
RV1	1-228-890-00	s	VAR,METAL 4.7k
RV2	1-228-888-00	s	VAR,METAL 1k
RV3	1-228-891-00	s	VAR,METAL 10k
RV4	1-228-892-00	s	VAR,METAL 22k
RV5	1-228-891-00	s	VAR,METAL 10k
RV6	1-228-892-00	s	VAR,METAL 22k
RV7	1-228-891-00	s	VAR,METAL 10k
RV8	1-228-890-00	s	VAR,METAL 4.7k
RV9	1-228-890-00	s	VAR,METAL 4.7k
RV10	1-228-894-00	s	VAR,METAL 47k
RV11	1-228-888-00	s	VAR,METAL 1k
RV12	1-228-892-00	s	VAR,METAL 22k
RV13	1-228-889-00	s	VAR,METAL 2200
T1	1-425-880-21	s	BURST AMP
X1	1-527-231-00	s	OSC,CERAMIC 4.433618MHz

DU-58 BOARD

Ref.No.	Parts No.	SP	Description
	1-611-954-11	o	PRINTED CIRCUIT BOARD,DU-58

DUS-3 BOARD

All of the component parts on the DUS-3 board are supplied together when you order AU-51A board.

Ref.No.	Parts No.	SP	Description
	1-611-961-11	o	PRINTED CIRCUIT BOARD,DUS-3
LV301	1-407-293-00	s	VAR,1.5mH

DUS-4 BOARD

Ref.No.	Parts No.	SP	Description
	1-611-963-11	o	PRINTED CIRCUIT BOARD,DUS-4
S1	1-554-251-00	s	REED,"TENREG"

DUS-5 BOARD

Ref.No.	Parts No.	SP	Description
	1-611-964-11	o	PRINTED CIRCUIT BOARD,DUS-5
SB1	8-719-919-10	s	55M22LS

DUS-33 BOARD

All of the component parts on the DUS-33 board are supplied together when you order SY-18C board.

Ref.No.	Parts No.	SP	Description
	1-613-317-11	o	PRINTED CIRCUIT BOARD,DUS-33
LV1	1-459-434-00	s	22mH
LV2	1-459-434-00	s	22mH

DUS-6 BOARD

Ref.No.	Parts No.	SP	Description
	1-611-965-11	o	PRINTED CIRCUIT BOARD,DUS-6
RV1	1-230-553-11	s	VAR,CARBON 100k "TRACKING"

DUS-69 BOARD

Ref.No.	Parts No.	SP	Description
	1-615-689-11	o	PRINTED CIRCUIT BOARD,DUS-69
RV1	1-230-858-11	s	VAR,CARBON 10k "EARPHONE LEVEL"

DUS-70 BOARD

Ref.No.	Parts No.	SP	Description
	1-615-977-11	o	PRINTED CIRCUIT BOARD,DUS-70

DUS-94 BOARD

All of the component parts on the DUS-94 board are supplied together when you order AU-64 board or AU-65 board.

Ref.No.	Parts No.	SP	Description
	1-615-980-11	o	PRINTED CIRCUIT BOARD,DUS-94

IF-99 BOARD

All of the component parts on the IF-99 board are supplied together when you order VO-12 board.

Ref.No.	Parts No.	SP	Description
	1-616-334-11	o	PRINTED CIRCUIT BOARD,IF-99
C601	1-161-059-00	s	CERAMIC 0.047 10% 50V
C602	1-161-059-00	s	CERAMIC 0.047 10% 50V
CN27	1-564-549-11	o	BOARD TO BOARD,10P
IC601	8-752-006-00	s	CX20060(SONY)

KY-86 BOARD

Ref.No.	Parts No.	SP	Description
	A-6717-404-A	o	MOUNTED CIRCUIT BOARD,KY-86
	1-806-956-11	s	LIQUID CRYSTAL
C21	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C22	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C41	1-161-459-00	s	CERAMIC CHIP 100PF 5% 50V
CN303	1-562-939-11	o	BECON 36P
D1	8-719-955-05	s	BR5505S
D2	8-719-955-05	s	BR5505S
D3	8-719-955-05	s	BR5505S
D4	8-719-955-05	s	BR5505S
D5	8-719-955-05	s	BR5505S

Ref.No.	Parts No.	SP	Description
D6	8-719-955-05	s	BR5505S
D7	8-719-955-05	s	BR5505S
D8	8-719-955-05	s	BR5505S
D9	8-719-955-05	s	BR5505S
D10	8-719-955-05	s	BR5505S
D11	8-719-955-05	s	BR5505S
D12	8-719-101-23	s	1SS123
D13	8-719-101-23	s	1SS123
D14	8-719-101-23	s	1SS123
D15	8-719-101-23	s	1SS123
D16	8-719-101-23	s	1SS123
IC1	8-759-911-65	s	MSM58421-74GSK(OKI)
IC2	8-759-201-05	s	TC4056BF(TOSHIBA)
IC3	8-759-200-83	s	TC4071BF(TOSHIBA)
IC4	8-759-200-92	s	TC5012BF(TOSHIBA)
IC5	8-759-200-68	s	TC4011BF(TOSHIBA)
IC7	8-759-700-43	s	NJM4558M(JRC)
IC8	8-759-200-99	s	TC4051BF(TOSHIBA)
IC9	8-759-200-92	s	TC5012BF(TOSHIBA)
IC10	8-759-204-28	s	TC5517AFL-2(TOSHIBA)
IC11	8-759-200-92	s	TC5012BF(TOSHIBA)
IC12	8-759-204-40	s	TC40H027F(TOSHIBA)
IC13	8-759-201-53	s	TC40H000F(TOSHIBA)
IC14	8-759-201-53	s	TC40H000F(TOSHIBA)
IC15	8-759-200-90	s	TC4538BF(TOSHIBA)
IC16	8-759-200-67	s	TC4001BF(TOSHIBA)
IC17	8-759-200-82	s	TC4069UBF(TOSHIBA)
PL1	1-518-566-11	s	FOR LCD
PL2	1-518-566-11	s	FOR LCD
Q1	8-729-177-43	s	2SD774
Q2	8-729-901-01	s	DTC144EK
Q3	8-729-901-01	s	DTC144EK
Q4	8-729-901-01	s	DTC144EK
Q6	8-729-900-52	s	DTC114YK
Q7	8-729-900-52	s	DTC114YK
Q8	8-729-900-52	s	DTC114YK
Q9	8-729-900-52	s	DTC114YK
Q10	8-729-900-52	s	DTC114YK
Q11	8-729-900-52	s	DTC114YK
Q12	8-729-900-52	s	DTC114YK
Q13	8-729-900-52	s	DTC114YK
Q14	8-729-900-52	s	DTC114YK
Q15	8-729-900-52	s	DTC114YK
Q16	8-729-100-66	s	2SC1623
Q17	8-729-901-46	s	DTA114YK
Q18	8-729-100-76	s	2SA812
Q19	8-729-901-01	s	DTC144EK
Q20	8-729-901-01	s	DTC144EK
Q21	8-729-901-01	s	DTC144EK
Q22	8-729-100-66	s	2SC1623

Ref.No.	Parts No.	SP	Description
R50	1-247-125-00	s	CARBON 560 5% 1/4W
R51	1-247-125-00	s	CARBON 560 5% 1/4W
R52	1-247-125-00	s	CARBON 560 5% 1/4W
R53	1-247-125-00	s	CARBON 560 5% 1/4W
R54	1-247-125-00	s	CARBON 560 5% 1/4W
R55	1-247-125-00	s	CARBON 560 5% 1/4W
R56	1-247-125-00	s	CARBON 560 5% 1/4W
R57	1-247-125-00	s	CARBON 560 5% 1/4W
R58	1-247-125-00	s	CARBON 560 5% 1/4W
R59	1-247-125-00	s	CARBON 560 5% 1/4W
R93	1-247-107-00	s	CARBON 100 5% 1/4W
R94	1-247-107-00	s	CARBON 100 5% 1/4W
RV1	1-230-894-11	s	VAR,CARBON 10k
RV2	1-230-894-11	s	VAR,CARBON 10k
S1	1-554-303-21	s	KEY "RESET"
S2	1-554-078-21	s	SLIDE "CTL/TC"
S3	1-554-078-21	s	SLIDE "LIGHT"
S4	1-554-263-11	s	KEY "STOP"
S5	1-554-263-11	s	KEY "PLAY"
S6	1-553-739-21	s	KEY "FF"
S7	1-553-739-21	s	KEY "REW"
S8	1-554-263-11	s	KEY "REC"
S9	1-553-739-21	s	KEY "DUB"
S10	1-553-739-21	s	KEY "PAUSE"
S11	1-554-377-21	s	SLIDE "INHIBIT"
X1	1-567-170-00	s	OSC. CERAMIC 4.194MHz

LE-20 BOARD

	1-611-956-11	o	PRINTED CIRCUIT BOARD,LE-20
D1	8-719-900-07	s	KL-1

LE-21 BOARD

	1-611-957-11	o	PRINTED CIRCUIT BOARD,LE-21
D1	8-719-900-07	s	KL-1

PA-48 BOARD

All of the component parts on the PA-48 board are supplied together when you order PSB-4 board.

Ref.No.	Parts No.	SP	Description
	1-615-966-11	o	PRINTED CIRCUIT BOARD,PA-48
C701	1-130-483-00	s	MYLAR 0.01 5% 50V
C702	1-130-485-00	s	MYLAR 0.015 5% 50V
C706	1-130-485-00	s	MYLAR 0.015 5% 50V
CN702	1-508-904-00	s	6P
CN703	1-508-905-00	s	8P
IC701	8-759-705-62	s	NJM4562D-D(JRC)
Q701	8-729-612-77	s	2SA1027-R
Q702	8-729-612-77	s	2SA1027-R
Q703	8-729-603-50	s	2SC403SP
R709	1-247-119-00	s	CARBON 330 5% 1/4W
R710	1-247-119-00	s	CARBON 330 5% 1/4W

PC-22 BOARD

Ref.No.	Parts No.	SP	Description
	1-611-960-11	o	PRINTED CIRCUIT BOARD,PC-22
IC1	8-719-800-81	s	TLP801A(TOSHIBA)

PSB-4 BOARD

This board includes the PA-48 board.

Ref.No.	Parts No.	SP	Description
⚠	A-6723-281-A	o	MOUNTED CIRCUIT BOARD,PSB-4
	1-533-037-XX	s	HOLDER,FUSE
	1-533-037-XX	s	HOLDER,FUSE
C24	1-124-343-00	s	ELECT 2200 20% 16V
C25	1-124-343-00	s	ELECT 2200 20% 16V
C26	1-124-556-11	s	ELECT 2200 20% 16V
C27	1-124-556-11	s	ELECT 2200 20% 16V
C34	1-127-492-00	s	ELECT 33 20% 10V
C35	1-127-492-00	s	ELECT 33 20% 10V
C36	1-127-492-00	s	ELECT 33 20% 10V
C37	1-127-499-00	s	ELECT 22 20% 16V
C40	1-124-343-00	s	ELECT 2200 20% 16V (S/N:10121 and higher)
C41	1-124-555-11	s	ELECT 1000 20% 16V (S/N:10121 and higher)
C108	1-163-251-00	s	CERAMIC CHIP 100PF 5% 50V
C109	1-130-475-00	s	MYLAR 0.0022 5% 50V
C120	1-163-243-00	s	CERAMIC CHIP 47PF 5% 50V
C701	1-130-483-00	s	MYLAR 0.01 5% 50V
C702	1-130-485-00	s	MYLAR 0.015 5% 50V
C706	1-130-495-00	s	MYLAR 0.1 5% 50V (S/N:10121 and higher)
D1	8-719-101-32	s	RD2.7EL1
D2	8-719-100-03	s	1S2835
D3	8-719-100-03	s	1S2835 (S/N:up to 10020)
D4	8-719-200-02	s	10E2
D5	8-719-136-07	s	RD3.6E-B
D6	8-719-162-07	s	RD6.2E
D7	8-719-101-49	s	RD5.1EL1
D8	8-719-162-07	s	RD6.2E
D9	8-719-162-07	s	RD6.2E
D11	8-719-127-07	s	RD2.7E
D12	8-719-910-74	s	HZ7B1L
D13	8-719-100-03	s	1S2835
D14	8-719-100-03	s	1S2835
D15	8-719-100-03	s	1S2835
D16	8-719-100-03	s	1S2835
D17	8-719-100-03	s	1S2835
D18	8-719-100-03	s	1S2835
D20	8-719-101-62	s	RD6.2EL3 (S/N:up to 10020)
D21	8-719-100-03	s	1S2835
D22	8-719-910-18	s	HZ11C2L
D23	8-719-104-24	s	1S2835
D101	8-719-101-23	s	1SS123
D102	8-719-101-23	s	1SS123
D103	8-719-104-22	s	1SS123
DDC1	1-464-528-11	s	CONVERTER,DC-DC
⚠F1	1-532-325-00	s	TIME-LAG
IC1	8-759-700-43	s	NJM4558M(JRC)
IC2	8-759-700-43	s	NJM4558M(JRC)
IC3	8-759-700-43	s	NJM4558M(JRC)
IC101	8-759-745-56	s	NJM4556D(JRC)
IC102	8-729-672-52	s	2SC2725(MITSUBISHI)
IC103	8-759-200-81	s	TC4053BF(TOSHIBA)
L101	1-408-096-00	s	470uH
Q1	8-729-113-33	s	2SB733-4
Q2	8-729-113-33	s	2SB733-4
Q3	8-729-901-01	s	DTC144EK
Q4	8-729-113-33	s	2SB733-4
Q5	8-729-882-52	s	2SB825-R

Ref.No.	Parts No.	SP	Description
Q6	8-729-315-63	s	2SB856
Q7	8-729-882-52	s	2SB825-R
Q8	8-729-612-77	s	2SA1027R
Q9	8-729-177-43	s	2SD774
Q11	8-729-900-52	s	DTC114YK
Q12	8-729-900-52	s	DTC114YK
Q13	8-729-900-52	s	DTC114YK
Q14	8-729-900-52	s	DTC114YK
Q15	8-729-100-76	s	2SA812
Q16	8-729-100-76	s	2SA812
Q17	8-729-900-52	s	DTC114YK
Q18	8-729-900-52	s	DTC114YK
Q19	8-729-900-52	s	DTC114YK
Q20	8-729-900-52	s	DTC114YK
Q21	8-729-100-76	s	2SA812
Q22	8-729-100-76	s	2SA812
Q24	8-729-900-52	s	DTC114YK
Q25	8-729-900-52	s	DTC114YK
Q26	8-729-100-76	s	2SA812
Q27	8-729-901-01	s	DTC144EK
Q28	8-729-901-01	s	DTC144EK
Q30	8-729-900-52	s	DTC114YK
Q101	8-729-113-33	s	2SB733-4
Q102	8-729-100-66	s	2SC1623
Q103	8-729-900-52	s	DTC114YK
Q104	8-729-100-66	s	2SC1623
Q105	8-729-900-52	s	DTC114YK
Q106	8-729-901-01	s	DTC144EK
Q107	8-729-901-01	s	DTC144EK
Q108	8-729-113-33	s	2SB733-4
Q109	8-729-100-66	s	2SC1623
Q110	8-729-901-01	s	DTC144EK
Q111	8-729-901-01	s	DTC144EK
Q112	8-729-901-21	s	DTC144EK
Q113	8-729-100-66	s	2SC1623
Q114	8-729-800-43	s	2SK152-3
Q115	8-729-901-01	s	DTC144EK
Q116	8-729-900-52	s	DTC114YK
Q117	8-729-900-52	s	DTC114YK
R68	1-532-605-00	s	LINK,IC
R69	1-532-605-00	s	LINK,IC
R70	1-532-605-00	s	LINK,IC
R73	1-247-107-00	s	CARBON 100 5% 1/4W
R74	1-247-107-00	s	CARBON 100 5% 1/4W
R75	1-247-107-00	s	CARBON 100 5% 1/4W
R76	1-247-107-00	s	CARBON 100 5% 1/4W
R127	1-215-459-00	s	METAL 39k 1% 1/6W
R133	1-215-445-00	s	METAL 10k 1% 1/6W
RV1	1-228-892-00	s	VAR,METAL 22k
RV2	1-228-890-00	s	VAR,METAL 4.7k
RV3	1-228-888-00	s	VAR,METAL 1k
RV4	1-228-888-00	s	VAR,METAL 1k
RV6	1-228-891-00	s	VAR,METAL 10k
RV102	1-228-888-00	s	VAR,METAL 1k

Ref.No.	Parts No.	SP	Description
RP-24 BOARD			
	A-6711-650-A	o	MOUNTED CIRCUIT BOARD,RP-24
C2	1-124-445-00	s	ELECT 100 20% 16V
C5	1-161-059-00	s	CERAMIC 0.047 10% 50V
CN631	1-506-471-11	o	6P
CP1	1-560-914-00	s	RECEPTACLE 2P
	1-561-724-00	s	PLUG 2P
CP2	1-560-914-00	s	RECEPTACLE 2P
	1-561-724-00	s	PLUG 2P
D1	8-719-815-55	s	1S1555
IC1	8-743-731-00	s	BX373A(SONY)
IC2	8-743-740-00	s	BX374(SONY)
IC3	8-741-136-10	s	BX1361(SONY)
IC4	8-741-136-10	s	BX1361(SONY)
Q1	8-729-201-05	s	2SC2878
Q2	8-729-201-05	s	2SC2878
R1	1-215-394-00	s	METAL 75 1% 1/6W
R2	1-215-420-00	s	METAL 910 1% 1/6W
R3	1-215-408-00	s	METAL 300 1% 1/6W
R6	1-215-376-00	s	METAL 13 1% 1/6W
R7	1-215-376-00	s	METAL 13 1% 1/6W
R8	1-215-376-00	s	METAL 13 1% 1/6W
R9	1-215-376-00	s	METAL 13 1% 1/6W
R15	1-215-457-00	s	METAL 33k 1% 1/6W
R16	1-215-457-00	s	METAL 33k 1% 1/6W
RV1	1-228-889-00	s	VAR,METAL 2.2k
RV2	1-228-889-00	s	VAR,METAL 2.2k
RV3	1-228-890-00	s	VAR,METAL 4.7k
RV4	1-228-890-00	s	VAR,METAL 4.7k
RV5	1-228-889-00	s	VAR,METAL 2.2k
RV7	1-228-889-00	s	VAR,METAL 2.2k
T1	1-426-199-11	s	HIGH FREQUENCY
T2	1-426-245-11	s	HIGH FREQUENCY
T3	1-426-245-11	s	HIGH FREQUENCY
T4	1-426-247-11	s	HIGH FREQUENCY
T5	1-426-247-11	s	HIGH FREQUENCY

Ref.No.	Parts No.	SP	Description
SV-57C BOARD			
	A-6715-265-B	o	MOUNTED CIRCUIT BOARD,SV-57C
C2	1-124-135-00	s	ELECT 470 20% 6.3V
C4	1-130-487-00	s	MYLAR 0.022 5% 50V
C6	1-130-487-00	s	MYLAR 0.022 5% 50V
C8	1-130-487-00	s	MYLAR 0.022 5% 50V
C9	1-130-483-00	s	MYLAR 0.01 5% 50V
C10	1-130-485-00	s	MYLAR 0.015 5% 50V
C11	1-130-483-00	s	MYLAR 0.01 5% 50V
C13	1-163-243-00	s	CERAMIC CHIP 47PF 5% 50V
C26	1-130-484-00	s	MYLAR 0.012 5% 50V
	(S/N:up to 10020)		
C26	1-130-481-00	s	MYLAR 0.0068 5% 50V
	(S/N:10021 and higher)		
C41	1-136-162-00	s	MYLAR 0.056 5% 50V
C42	1-136-160-00	s	MYLAR 0.039 5% 50V
C43	1-130-491-00	s	MYLAR 0.047 5% 50V
C44	1-130-483-00	s	MYLAR 0.01 5% 50V
C45	1-130-481-00	s	MYLAR 0.0068 5% 50V
C51	1-130-497-00	s	MYLAR 0.15 5% 50V
C61	1-123-321-00	s	ELECT 220 20% 16V
C67	1-130-491-00	s	MYLAR 0.047 5% 50V
C69	1-136-162-00	s	MYLAR 0.056 5% 50V
C74	1-123-321-00	s	ELECT 220 20% 16V
C79	1-130-479-00	s	MYLAR 0.0047 5% 50V
C83	1-130-477-00	s	MYLAR 0.0033 5% 50V
C90	1-123-321-00	s	ELECT 220 20% 16V
C92	1-123-321-00	s	ELECT 220 20% 16V
C94	1-123-321-00	s	ELECT 220 20% 16V
C123	1-163-243-00	s	CERAMIC CHIP 47PF 5% 50V
C127	1-163-227-00	s	CERAMIC CHIP 10PF 5% 50V
C128	1-102-110-00	s	CERAMIC CHIP 220PF 10% 50V
D1	8-719-911-19	s	1SS119
D2	8-719-911-19	s	1SS119
D3	8-719-911-19	s	1SS119
D4	8-719-100-05	s	1S2837
D6	8-719-101-23	s	1SS123
D7	8-719-101-23	s	1SS123
D8	8-719-101-23	s	1SS123
D10	8-719-100-03	s	1S2835
D11	8-719-100-03	s	1S2835
D12	8-719-100-03	s	1S2835
D13	8-719-911-19	s	1SS119
D14	8-719-911-19	s	1SS119
D15	8-719-101-23	s	1SS123
D16	8-719-101-23	s	1SS123
D17	8-719-100-05	s	1S2837
D18	8-719-191-07	s	RD9.1E
D19	8-719-981-04	s	ERB81-004
D20	8-719-911-19	s	1SS119
D21	8-719-100-05	s	1S2837
D22	8-719-100-05	s	1S2837
D23	8-719-191-07	s	RD9.1E
D24	8-719-981-04	s	ERB81-004
D25	8-719-101-23	s	1SS123
D26	8-719-101-23	s	1SS123
D27	8-719-911-19	s	1SS119
D28	8-719-100-05	s	1S2837
D30	8-719-911-19	s	1SS119
D31	8-719-981-04	s	ERB81-004
D32	8-719-100-03	s	1S2835
D33	8-719-911-19	s	1SS119
D34	8-719-101-23	s	1SS123
D35	8-719-101-76	s	RD10E-L2
D36	8-719-911-19	s	1SS119
D38	8-719-100-05	s	1S2837
D39	8-719-100-05	s	1S2837
D40	8-719-100-03	s	1S2835
D41	8-719-911-19	s	1SS119
D42	8-719-100-05	s	1S2837
	(S/N:up to 10020)		
D43	8-719-911-19	s	1SS119
D44	8-719-100-03	s	1S2835
IC1	8-751-941-04	s	CX194B-4(SONY)
IC2	8-749-909-15	s	BX3915A(SONY)
IC3	8-759-200-68	s	TC4011BF(TOSHIBA)
IC4	8-759-200-90	s	TC4538BF(TOSHIBA)
IC5	8-759-200-68	s	TC4011BF(TOSHIBA)
IC6	8-759-200-68	s	TC4011BF(TOSHIBA)
IC7	8-759-200-82	s	TC4069UBF(TOSHIBA)
IC8	8-759-200-80	s	TC4050BF(TOSHIBA)
IC9	8-759-200-90	s	TC4538BF(TOSHIBA)
IC10	8-759-200-90	s	TC4538BF(TOSHIBA)
IC11	8-759-200-90	s	TC4538BF(TOSHIBA)
IC12	8-759-200-82	s	TC4069UBF(TOSHIBA)
IC13	8-759-100-95	s	uPC324G2(NEC)
IC14	8-759-100-95	s	uPC324G2(NEC)
IC15	8-759-100-95	s	uPC324G2(NEC)
IC16	8-759-100-93	s	uPC393G2(NEC)
IC17	8-759-200-82	s	TC4069UBF(TOSHIBA)
IC18	8-759-200-67	s	TC4001BF(TOSHIBA)
IC19	8-759-100-93	s	uPC393G2(NEC)
IC20	8-759-100-93	s	uPC393G2(NEC)
IC21	8-759-200-78	s	TC4030BF(TOSHIBA)
IC22	8-759-200-81	s	TC4053BF(TOSHIBA)
IC23	8-759-200-81	s	TC4053BF(TOSHIBA)
IC24	8-759-200-81	s	TC4053BF(TOSHIBA)
IC25	8-759-200-65	s	TC4013BF(TOSHIBA)
IC26	8-759-100-93	s	uPC393G2(NEC)
IC27	8-759-200-81	s	TC4053BF(TOSHIBA)
IC28	8-759-100-96	s	uPC4558G2(NEC)
IC29	8-759-200-90	s	TC4538BF(TOSHIBA)
L1	1-459-155-00	s	45uH
L2	1-408-298-00	s	2mH
L3	1-408-298-00	s	2mH
L4	1-408-298-00	s	2mH
Q1	8-729-100-66	s	2SC1623
Q2	8-729-100-76	s	2SA812
Q3	8-729-100-66	s	2SC1623
Q4	8-729-603-50	s	2SC403SP
Q5	8-729-901-06	s	DTA144EK
Q6	8-729-901-01	s	DTC144EK
Q7	8-729-100-66	s	2SC1623
Q8	8-729-100-66	s	2SC1623
Q9	8-729-100-66	s	2SC1623
Q10	8-729-100-66	s	2SC1623

Ref.No.	Parts No.	SP	Description
Q11	8-729-100-76	s	2SA812
Q12	8-729-901-01	s	DTC144EK
Q13	8-729-901-01	s	DTC144EK
Q14	8-729-901-01	s	DTC144EK
Q15	8-729-901-06	s	DTA144EK
Q16	8-729-100-76	s	2SA812
Q17	8-729-202-62	s	2SD1221
Q18	8-729-100-76	s	2SA812
Q19	8-729-202-62	s	2SD1221
Q20	8-729-901-01	s	DTC144EK
Q21	8-729-901-01	s	DTC144EK
Q22	8-729-901-01	s	DTC144EK
Q23	8-729-901-06	s	DTA144EK
Q24	8-729-100-76	s	2SA812
Q25	8-729-200-46	s	2SD1160
Q26	8-729-100-66	s	2SC1623
Q27	8-729-100-66	s	2SC1623
Q28	8-729-901-01	s	DTC144EK
Q29	8-729-901-01	s	DTC144EK
Q30	8-729-901-06	s	DTA144EK
Q31	8-729-901-01	s	DTC144EK
Q32	8-729-901-06	s	DTA144EK
Q33	8-729-100-76	s	2SA812
Q34	8-729-202-62	s	2SD1221
Q35	8-729-100-76	s	2SA812
Q36	8-729-202-62	s	2SD1221
Q37	8-729-100-66	s	2SC1623
Q38	8-729-100-66	s	2SC1623
Q39	8-729-100-66	s	2SC1623
Q40	8-729-100-66	s	2SC1623
Q41	8-729-100-66	s	2SC1623
Q42	8-729-100-66	s	2SC1623
Q43	8-729-100-66	s	2SC1623
Q44	8-729-100-66	s	2SC1623
Q45	8-729-901-01	s	DTC144EK
Q46	8-729-100-76	s	2SA812
Q47	8-729-901-01	s	DTC144EK
Q48	8-729-175-73	s	2SC2757
Q49	8-729-901-06	s	DTA144EK
Q50	8-729-901-06	s	DTA144EK
Q51	8-729-901-06	s	DTA144EK
Q52	8-729-901-06	s	DTA144EK
Q53	8-729-901-01	s	DTC144EK
Q54	8-729-100-76	s	2SA812
	(S/N:up to 10020)		
R1	1-215-373-31	s	METAL 10 1% 1/6W
R256	1-207-616-00	s	WIREWOUND 0.47 10% 3W
R258	1-532-675-00	s	LINK, IC
R259	1-532-686-00	s	LINK, IC
R274	1-215-373-31	s	METAL 10 1% 1/6W
RV1	1-228-895-00	s	VAR,METAL 100k
RV2	1-228-894-00	s	VAR,METAL 47k
RV3	1-228-895-00	s	VAR,METAL 100k
RV4	1-228-894-00	s	VAR,METAL 47k
RV5	1-228-895-00	s	VAR,METAL 100k
RV6	1-228-897-00	s	VAR,METAL 470k
RV7	1-228-894-00	s	VAR,METAL 47k
RV8	1-228-897-00	s	VAR,METAL 470k
RV9	1-228-890-00	s	VAR,METAL 4.7k
RV10	1-228-888-00	s	VAR,METAL 1k

Ref.No.	Parts No.	SP	Description
RV11	1-228-894-00	s	VAR,METAL 47k
RV12	1-228-891-00	s	VAR,METAL 10k
RV13	1-228-895-00	s	VAR,METAL 100k
RV14	1-228-896-00	s	VAR,METAL 220k
X1	1-567-146-21	s	OSC. CRYSTAL 4.433618MHz

SWB-4 BOARD

Ref.No.	Parts No.	SP	Description
	1-615-967-11	o	PRINTED CIRCUIT BOARD,SWB-4
C1	1-161-059-00	s	CERAMIC 0.047 10% 50V
S1	1-554-076-00	s	SLIDE "AUDIO LEVEL AGC ON/OFF"
S2	1-554-075-00	s	SLIDE "METER SELECT VIDEO/BATT/CH-1"

SY-18C BOARD

This board includes the DUS-33 board.

Ref.No.	Parts No.	SP	Description
	A-6717-405-A	o	MOUNTED CIRCUIT BOARD,SY-18C
C7	1-163-133-00	s	CERAMIC CHIP 470PF 5% 50V
C10	1-124-435-00	s	ELECT 10 20% 6.3V
C13	1-163-117-00	s	CERAMIC CHIP 100PF 5% 50V
C16	1-163-117-00	s	CERAMIC CHIP 100PF 5% 50V
C17	1-163-133-00	s	CERAMIC CHIP 470PF 5% 50V
C19	1-124-462-00	s	ELECT 10 20% 16V
C23	1-124-435-00	s	ELECT 10 20% 6.3V
C27	1-124-435-00	s	ELECT 10 20% 6.3V
C28	1-163-141-00	s	CERAMIC CHIP 0.001 5% 50V
C29	1-163-141-00	s	CERAMIC CHIP 0.001 5% 50V
C31	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C32	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C33	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C34	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C36	1-124-435-00	s	ELECT 10 20% 6.3V
C37	1-130-473-00	s	MYLAR 0.0015 5% 50V
C38	1-124-464-11	s	ELECT 0.22 20% 50V
C42	1-124-465-00	s	ELECT 0.47 20% 50V
C43	1-124-435-00	s	ELECT 10 20% 6.3V
C44	1-130-473-00	s	MYLAR 0.0015 5% 50V
C45	1-124-464-11	s	ELECT 0.22 20% 50V
C49	1-124-465-00	s	ELECT 0.47 20% 50V
C51	1-124-465-00	s	ELECT 0.47 20% 50V
C53	1-124-465-00	s	ELECT 0.47 20% 50V
C54	1-124-465-00	s	ELECT 0.47 20% 50V
C62	1-161-059-00	s	CERAMIC 0.047 10% 50V
C125	1-124-465-00	s	ELECT 0.47 20% 50V
C127	1-124-465-00	s	ELECT 0.47 20% 50V

Ref.No.	Parts No.	SP	Description
CN1	1-564-317-00	o	BOARD TO BOARD,5P
CN141	1-564-630-11	o	RECEPTACLE,14P
	1-562-185-11	o	HOUSING,14P
	1-564-026-00	o	CONTACT
CN144	1-564-630-11	o	RECEPTACLE,14P
	1-562-185-11	o	HOUSING,14P
	1-564-026-00	o	CONTACT
D1	8-719-100-05	s	1S2837
D2	8-719-100-05	s	1S2837
D3	8-719-100-37	s	RD6.2E-B1
D4	8-719-911-19	s	1SS119
D5	8-719-100-05	s	1S2837
D6	8-719-100-05	s	1S2837
D8	8-719-100-03	s	1S2835
D9	8-719-100-05	s	1S2837
D10	8-719-911-19	s	1SS119
D11	8-719-101-43	s	RD4.3E-L2
D12	8-719-911-19	s	1SS119
D13	8-719-101-32	s	RD2.7E-L1
D17	8-719-100-05	s	1S2837
D18	8-719-100-05	s	1S2837
D19	8-719-100-05	s	1S2837
D20	8-719-100-05	s	1S2837
D23	8-719-911-19	s	1SS119
D25	8-719-100-03	s	1S2835
D26	8-719-911-19	s	1SS119
D27	8-719-911-19	s	1SS119
IC1	8-752-800-17	s	CXQ88501-350Q(SONY)
IC2	8-752-800-18	s	CXQ88501-351Q(SONY)
IC3	8-759-200-88	s	TC4512BF(TOSHIBA)
IC4	8-759-200-88	s	TC4512BF(TOSHIBA)
IC5	8-759-200-88	s	TC4512BF(TOSHIBA)
IC6	8-759-200-88	s	TC4512BF(TOSHIBA)
IC7	8-759-102-82	s	uPD82C43G(NEC)
IC8	8-759-102-82	s	uPD82C43G(NEC)
IC9	8-759-913-99	s	MB88201-173N(FUJITSU)
IC10	8-759-201-53	s	TC40H000F(TOSHIBA)
IC11	8-759-204-20	s	TC4024BF(TOSHIBA)
IC12	8-759-200-68	s	TC4011BF(TOSHIBA)
IC13	8-759-700-07	s	NJM2903M(JRC)
IC14	8-759-700-07	s	NJM2903M(JRC)
IC15	8-759-745-64	s	NJM4560M(JRC)
IC16	8-759-200-78	s	TC4030BF(TOSHIBA)
IC17	8-759-700-07	s	NJM2903M(JRC)
IC18	8-759-200-90	s	TC4538BF(TOSHIBA)
IC19	8-759-200-84	s	TC4081BF(TOSHIBA)
IC20	8-759-200-68	s	TC4011BF(TOSHIBA)
IC21	8-759-200-84	s	TC4081BF(TOSHIBA)
IC22	8-759-200-84	s	TC4081BF(TOSHIBA)
IC23	8-759-200-81	s	TC4053BF(TOSHIBA)
IC24	8-759-200-90	s	TC4538BF(TOSHIBA)
LV1	1-459-437-00	s	VAR,22mH
LV2	1-459-437-00	s	VAR,22mH

Ref.No.	Parts No.	SP	Description
Q1	8-729-100-76	s	2SA812
Q2	8-729-100-76	s	2SA812
Q3	8-729-100-66	s	2SC1623
Q4	8-729-100-66	s	2SC1623
Q5	8-729-901-01	s	DTC144EK
Q6	8-729-901-01	s	DTC144EK
Q7	8-729-901-01	s	DTC144EK
Q8	8-729-901-01	s	DTC144EK
Q9	8-729-901-06	s	DTA144EK
Q10	8-729-901-01	s	DTC144EK
Q11	8-729-100-66	s	2SC1623
Q12	8-729-100-66	s	2SC1623
Q13	8-729-901-06	s	DTA144EK
Q14	8-729-901-01	s	DTC144EK
Q15	8-729-901-01	s	DTC144EK
Q16	8-729-901-06	s	DTA144EK
Q17	8-729-901-01	s	DTC144EK
Q18	8-729-901-01	s	DTC144EK
Q19	8-729-901-01	s	DTC144EK
Q20	8-729-901-06	s	DTA144EK
Q22	8-729-901-01	s	DTC144EK
Q23	8-729-901-01	s	DTC144EK
Q25	8-729-901-01	s	DTC144EK
Q28	8-729-901-01	s	DTC144EK
Q29	8-729-901-01	s	DTC144EK
Q30	8-729-901-01	s	DTC144EK
Q32	8-729-100-66	s	2SC1623
Q33	8-729-100-66	s	2SC1623
Q34	8-729-100-76	s	2SA812
Q35	8-729-901-01	s	DTC144EK
Q38	8-729-100-66	s	2SC1623
R54	1-215-408-00	s	METAL 300 1% 1/6W
R55	1-215-446-00	s	METAL 11k 1% 1/6W
R71	1-215-447-00	s	METAL 12k 1% 1/6W
R72	1-215-451-00	s	METAL 18k 1% 1/6W
RV1	1-228-395-00	s	VAR,METAL 10k
RV2	1-228-813-00	s	VAR,METAL 470k
RV3	1-228-813-00	s	VAR,METAL 470k
X1	1-567-145-00	s	OSC. CRYSTAL 3.579545MHz
X2	1-527-822-00	s	OSC. CERAMIC 4.0MHz

SY-22A BOARD

This board includes the SY-23 board.

	A-6717-406-A	o	MOUNTED CIRCUIT BOARD,SY-22A
C5	1-163-235-00	s	CERAMIC CHIP 22PF 5% 50V
C9	1-102-114-00	s	CERAMIC 470PF 10% 50V
C11	1-102-114-00	s	CERAMIC 470PF 10% 50V
C36	1-124-438-00	s	ELECT 1 20% 50V
C38	1-124-343-00	s	ELECT 2200 20% 16V

Ref.No.	Parts No.	SP	Description
C39	1-124-343-00	s	ELECT 2200 20% 16V
C40	1-124-343-00	s	ELECT 2200 20% 16V
CN265	1-557-607-11	o	FLAT CABLE,19P
D1	8-719-101-23	s	1SS123
D2	8-719-100-03	s	1S2835
D3	8-719-100-03	s	1S2835
D4	8-719-100-03	s	1S2835
D5	8-719-100-03	s	1S2835
D6	8-719-100-03	s	1S2835
D7	8-719-100-03	s	1S2835
D8	8-719-911-19	s	1SS119
D9	8-719-911-19	s	1SS119
D10	8-719-100-05	s	1S2837
D11	8-719-100-05	s	1S2837
IC1	8-759-201-60	s	TC40H002F(TOSHIBA)
IC2	8-759-911-72	s	MB88501-247M(FUJITSU)
IC3	8-759-201-47	s	TA7357AP(TOSHIBA)
IC4	8-759-400-89	s	MN1237AD(MATSUSHITA)
IC5	8-759-102-82	s	uPD82C43G(NEC)
IC6	8-759-200-67	s	TC4001BF(TOSHIBA)
IC7	8-759-600-24	s	M54543L(MITSUBISHI)
IC8	8-759-200-90	s	TC4538BF(TOSHIBA)
IC9	8-759-102-82	s	uPD82C43G(NEC)
IC10	8-759-200-79	s	TC4049BF(TOSHIBA)
IC11	8-741-135-40	s	BX1354(SONY)
Q2	8-729-901-01	s	DTC144EK
Q3	8-729-901-01	s	DTC144EK
Q8	8-729-901-01	s	DTC144EK
Q9	8-729-901-01	s	DTC144EK
Q10	8-729-901-01	s	DTC144EK
Q11	8-729-901-06	s	DTA144EK
Q12	8-729-901-06	s	DTA144EK
Q13	8-729-901-01	s	DTC144EK
Q14	8-729-901-01	s	DTC144EK
Q15	8-729-901-06	s	DTA144EK
Q16	8-729-901-01	s	DTC144EK
Q17	8-729-901-06	s	DTA144EK
Q19	8-729-901-01	s	DTC144EK
Q20	8-729-901-01	s	DTC144EK
Q22	8-729-901-01	s	DTC144EK
Q26	8-729-901-01	s	DTC144EK
R23	1-215-478-00	s	METAL 240k 1% 1/6W
R24	1-215-471-00	s	METAL 120k 1% 1/6W
R25	1-215-464-00	s	METAL 62k 1% 1/6W
R120	1-532-686-21	s	LINK, IC
R121	1-532-686-21	s	LINK, IC
R122	1-532-686-21	s	LINK, IC
RV1	1-228-394-00	s	VAR,METAL 4.7k
RV2	1-228-760-00	s	VAR,METAL 47k
S1	1-553-977-00	s	SLIDE "TEST DISPLAY"

Ref.No. Parts No. SP Description

SY-23 BOARD

All of the component parts on the SY-23 board are supplied together when you order SY-22 board.

Ref.No.	Parts No.	SP	Description
	1-613-101-11	o	PRINTED CIRCUIT BOARD,SY-23
C3	1-124-436-00	s	ELECT 3.3 20% 25V
D1	8-719-981-01	s	ERA81-004
D2	8-719-100-05	s	1S2837
D3	8-719-200-02	s	10E-2
D4	8-719-160-63	s	RD15F-B3
D5	8-719-981-01	s	ERA81-004
D6	8-719-100-05	s	1S2837
D7	8-719-200-02	s	10E-2
D8	8-719-160-63	s	RD15F-B3
D9	8-719-200-02	s	10E-2
D10	8-719-160-63	s	RD15F-B3
D11	8-719-981-01	s	ERA81-004
D12	8-719-100-05	s	1S2837
D13	8-719-200-02	s	10E-2
D14	8-719-160-63	s	RD15F-B3
D15	8-719-200-02	s	10E-2
D16	8-719-160-63	s	RD15F-B3
D17	8-719-200-02	s	10E-2
D18	8-719-160-63	s	RD15F-B3
D20	8-719-100-05	s	1S2837
D21	8-719-100-05	s	1S2837
IC1	8-759-200-80	s	TC4050BF(TOSHIBA)
IC2	8-759-200-80	s	TC4050BF(TOSHIBA)
Q2	8-729-901-01	s	DTC144EK
Q3	8-729-901-46	s	DTA114YK
Q4	8-729-200-46	s	2SD1160
Q5	8-729-901-01	s	DTC144EK
Q6	8-729-901-01	s	DTC144EK
Q7	8-729-901-46	s	DTA114YK
Q8	8-729-200-46	s	2SD1160
Q10	8-729-901-01	s	DTC144EK
Q11	8-729-901-46	s	DTA114YK
Q12	8-729-200-46	s	2SD1160
Q13	8-729-901-01	s	DTC144EK
Q14	8-729-901-01	s	DTC144EK
Q15	8-729-901-46	s	DTA114YK
Q16	8-729-200-46	s	2SD1160
Q17	8-729-901-01	s	DTC144EK
Q18	8-729-901-46	s	DTA114YK
Q19	8-729-200-46	s	2SD1160
Q20	8-729-901-01	s	DTC144EK
Q21	8-729-901-46	s	DTA114YK
Q22	8-729-200-46	s	2SD1160
Q24	8-729-901-01	s	DTC144EK
Q25	8-729-901-46	s	DTA114YK
Q26	8-729-200-46	s	2SD1160
Q27	8-729-901-01	s	DTC144EK
Q28	8-729-901-01	s	DTC144EK

Ref.No.	Parts No.	SP	Description
Q29	8-729-901-46	s	DTA114YK
Q30	8-729-200-46	s	2SD1160
Q31	8-729-901-01	s	DTC144EK
Q32	8-729-901-46	s	DTA114YK
Q33	8-729-200-46	s	2SD1160
Q34	8-729-901-01	s	DTC144EK
Q35	8-729-901-46	s	DTA114YK
Q36	8-729-200-46	s	2SD1160
Q37	8-729-901-01	s	DTC144EK
Q38	8-729-901-46	s	DTA114YK
Q39	8-729-200-46	s	2SD1160
Q40	8-729-901-01	s	DTC144EK
Q41	8-729-901-46	s	DTA114YK
Q42	8-729-200-46	s	2SD1160
Q43	8-729-901-46	s	DTA114YK

TM-19 BOARD

	1-613-881-11	o	PRINTED CIRCUIT BOARD,TM-19
	1-548-119-21	s	HOURS METER

VA-29 BOARD

	A-6711-647-A	o	MOUNTED CIRCUIT BOARD,VA-29
C1	1-124-584-00	s	ELECT 100 20% 10V
C10	1-124-584-00	s	ELECT 100 20% 10V
C11	1-130-471-00	s	MYLAR 0.001 5% 50V
C17	1-161-462-00	s	CERAMIC 180PF 5% 50V
C24	1-124-584-00	s	ELECT 100 20% 10V
C27	1-107-211-00	s	MICA 24PF 5% 500V
C28	1-124-584-00	s	ELECT 100 20% 10V
C29	1-107-202-00	s	MICA 10PF 5% 500V
CN1	1-562-639-11	o	10P
CN2	1-562-639-11	o	10P
D1	8-719-709-25	s	1S1925-P
D2	8-719-709-25	s	1S1925-P
D3	8-719-104-10	s	1SS99
D4	8-719-104-10	s	1SS99
D5	8-719-104-10	s	1SS99
D6	8-719-104-10	s	1SS99
IC1	8-759-200-60	s	TA7060AP(TOSHIBA)
IC2	8-759-200-60	s	TA7060AP(TOSHIBA)
L6	1-407-504-00	s	10mH
L7	1-407-504-00	s	10mH

Ref.No.	Parts No.	SP	Description
Q1	8-729-271-22	s	2SC2712G
Q2	8-729-271-22	s	2SC2712G
Q3	8-729-271-22	s	2SC2712G
Q4	8-729-216-22	s	2SA1162G
Q5	8-729-271-22	s	2SC2712G
Q6	8-729-216-22	s	2SA1162G
Q7	8-729-603-50	s	2SC403SP
Q8	8-729-603-50	s	2SC403SP
Q9	8-729-271-22	s	2SC2712G
Q10	8-729-271-22	s	2SC2712G
Q11	8-729-271-22	s	2SC2712G
Q12	8-729-271-22	s	2SC2712G
Q13	8-729-271-22	s	2SC2712G
Q14	8-729-271-22	s	2SC2712G
Q15	8-729-271-22	s	2SC2712G
Q16	8-729-400-76	s	2SD1030
Q17	8-729-271-22	s	2SC2712G
Q18	8-729-271-22	s	2SC2712G
R3	1-215-413-00	s	METAL 470 1% 1/6W
R17	1-215-405-00	s	METAL 220 1% 1/6W
R18	1-215-405-00	s	METAL 220 1% 1/6W
R19	1-215-450-00	s	METAL 16K 1% 1/6W
R22	1-215-402-00	s	METAL 160 1% 1/6W
R23	1-215-408-00	s	METAL 300 1% 1/6W
R26	1-215-394-00	s	METAL 75 1% 1/6W
R43	1-215-415-00	s	METAL 560 1% 1/6W
R44	1-215-405-00	s	METAL 220 1% 1/6W
R45	1-215-412-00	s	METAL 430 1% 1/6W
RV1	1-224-950-00	s	VAR,METAL 10k (S/N:up to 10020)
RV2	1-224-947-00	s	VAR,METAL 1k (S/N:up to 10020)
RV3	1-224-947-00	s	VAR,METAL 1k (S/N:up to 10020)
RV4	1-224-947-00	s	VAR,METAL 1k (S/N:up to 10020)
RV1	1-228-474-00	s	VAR,CERMET 10k (S/N:10021 and higer)
RV2	1-228-471-00	s	VAR,CERMET 1k (S/N:10021 and higer)
RV3	1-228-471-00	s	VAR,CERMET 1k (S/N:10021 and higer)
RV4	1-228-471-00	s	VAR,CERMET 1k (S/N:10021 and higer)

VO-12 BOARD

This board includes the IF-99 board.

	A-6711-646-A	o	MOUNTED CIRCUIT BOARD,VO-12
C2	1-124-584-00	s	ELECT 100 20% 10V
C3	1-163-141-00	s	CERAMIC CHIP 0.001 5% 50V
C8	1-130-483-00	s	MYLAR 0.01 5% 50V
C10	1-130-483-00	s	MYLAR 0.01 5% 50V
C11	1-107-208-00	s	MICA 18PF 5% 500V
C12	1-107-037-00	s	MICA 82PF 5% 500V
C15	1-124-584-00	s	ELECT 100 20% 10V
C102	1-124-584-00	s	ELECT 100 20% 10V
C107	1-107-206-00	s	MICA 15PF 5% 500V
C114	1-130-499-00	s	MYLAR 0.22 5% 50V
C119	1-107-210-00	s	MICA 22PF 5% 500V
C120	1-107-036-00	s	MICA 68PF 5% 500V
C121	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C123	1-107-158-00	s	MICA 30PF 5% 500V
C124	1-107-158-00	s	MICA 30PF 5% 500V

Ref.No.	Parts No.	SP	Description
C128	1-130-475-00	s	MYLAR 0.0022 5% 50V
C137	1-107-202-00	s	MICA 10PF 5% 500V
C138	1-109-689-00	s	MICA 470PF 1% 500V
C139	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C140	1-107-026-00	s	MICA 5.1PF 0.5PF 500V
C150	1-124-584-00	s	ELECT 100 20% 10V
C151	1-107-158-00	s	MICA 30PF 5% 500V
C204	1-107-159-00	s	MICA 33PF 5% 500V
C207	1-107-159-00	s	MICA 33PF 5% 500V
C216	1-130-475-00	s	MYLAR 0.0022 5% 50V
C231	1-161-470-00	s	CERAMIC 820PF 5% 50V
C255	1-107-169-00	s	MICA 100PF 5% 500V
C256	1-107-043-00	s	MICA 2.7PF 0.5PF 500V
C257	1-107-204-00	s	MICA 12PF 5% 500V
C258	1-107-204-00	s	MICA 12PF 5% 500V
C259	1-107-159-00	s	MICA 33PF 5% 500V
C260	1-107-159-00	s	MICA 33PF 5% 500V
C261	1-107-159-00	s	MICA 33PF 5% 500V
C262	1-107-159-00	s	MICA 33PF 5% 500V
C271	1-107-157-00	s	MICA 27PF 5% 500V
C272	1-107-157-00	s	MICA 27PF 5% 500V
C302	1-109-689-00	s	MICA 470PF 1% 500V
C304	1-124-584-00	s	ELECT 100 20% 10V
C305	1-124-584-00	s	ELECT 100 20% 10V
C310	1-124-584-00	s	ELECT 100 20% 10V
C311	1-124-584-00	s	ELECT 100 20% 10V
C314	1-107-206-00	s	MICA 15PF 5% 500V
C315	1-107-210-00	s	MICA 22PF 5% 500V
C326	1-124-584-00	s	ELECT 100 20% 10V
C327	1-124-584-00	s	ELECT 100 20% 10V
C328	1-107-164-00	s	MICA 51PF 5% 500V
C332	1-161-059-00	s	CERAMIC 0.047 10% 50V
C333	1-123-332-00	s	ELECT 47 20% 16V
C334	1-107-211-00	s	MICA 24PF 5% 500V
C408	1-124-584-00	s	ELECT 100 20% 10V
C411	1-107-157-00	s	MICA 27PF 5% 500V
C413	1-130-474-00	s	MYLAR 0.0018 5% 50V
C432	1-107-162-00	s	MICA 43PF 5% 500V
C434	1-107-079-00	s	MICA 56PF 5% 500V
C435	1-107-206-00	s	MICA 15PF 5% 500V
C442	1-130-471-00	s	MYLAR 0.001 5% 50V
C503	1-130-471-00	s	MYLAR 0.001 5% 50V
C555	1-161-468-00	s	CERAMIC 560PF 5% 50V
C556	1-130-478-00	s	MYLAR 0.0039 5% 50V
C601	1-161-059-00	s	CERAMIC 0.047 10% 50V
C602	1-161-059-00	s	CERAMIC 0.047 10% 50V
CN19	1-562-957-11	o	10P
CN22	1-562-482-11	o	20P
CN23	1-564-680-11	o	10P
CN24	1-564-680-11	o	10P
CN25	1-564-680-11	o	10P
CN26	1-564-680-11	o	10P
CN27	1-564-318-00	o	BOARD TO BOARD,10P
CV301	1-141-246-00	s	TRIMMER
CV302	1-141-246-00	s	TRIMMER

Ref.No.	Parts No.	SP	Description
D1	8-719-911-19	s	1SS119
D2	8-719-911-19	s	1SS119
D3	8-719-127-07	s	RD2.7E
D4	8-719-911-19	s	1SS119
D101	8-719-709-25	s	1S1925-P
D102	8-719-709-25	s	1S1925-P
D103	8-719-911-19	s	1SS119
D104	8-719-139-07	s	RD3.9E-B
D105	8-719-911-19	s	1SS119
D106	8-719-911-19	s	1SS119
D107	8-719-911-19	s	1SS119
D108	8-719-911-19	s	1SS119
D201	8-719-812-41	s	TLR124
D202	8-719-911-19	s	1SS119 (S/N:10191 and higher)
D401	8-719-911-19	s	1SS119
D501	8-719-100-05	s	1S2837
D502	8-719-100-05	s	1S2837
D503	8-719-100-05	s	1S2837
D504	8-719-100-05	s	1S2837
DL101	1-415-403-11	s	1000nS
DL201	1-415-154-21	s	35nS
DL202	1-415-154-21	s	35nS
DL301	1-415-273-00	s	1H
DL401	1-415-402-11	s	10nS
DL551	1-415-402-11	s	10nS
FL101	1-235-009-21	s	HIGH PASS
FL102	1-235-477-11	s	HIGH PASS
FL201	1-235-478-11	s	HIGH PASS
FL202	1-235-010-21	s	HIGH PASS
FL301	1-235-600-11	s	LOW PASS
FL302	1-235-575-11	s	LOW PASS
FL401	1-235-473-11	s	LOW PASS
IC1	8-759-200-68	s	TC4011BF(TOSHIBA)
IC2	8-759-200-90	s	TC4538BF(TOSHIBA)
IC101	8-751-870-00	s	CX187(SONY)
IC102	8-759-206-29	s	TA7060AP-SONY(SONY)
IC103	8-759-206-29	s	TA7060AP-SONY(SONY)
IC104	8-741-125-70	s	BX1257(SONY)
IC105	8-752-006-10	s	CX20061(SONY)
IC201	8-752-004-50	s	CX20045(SONY)
IC202	8-741-125-40	s	BX1254(SONY)
IC203	8-741-125-30	s	BX1253(SONY)
IC204	8-741-114-00	s	BX1140(SONY)
IC205	8-752-006-10	s	CX20061(SONY)
IC206	8-759-400-06	s	AN608P(SONY)
IC207	8-759-708-05	s	NJM78L05A(JRC)
IC301	8-752-006-00	s	CX20060(SONY)
IC302	8-759-400-06	s	AN608P(SONY)
IC303	8-759-708-09	s	NJM78L09A(JRC)
IC304	8-743-949-00	s	BX3949(SONY)
IC401	8-759-201-35	s	TA7672P(TOSHIBA)
IC402	8-741-124-70	s	BX1247(SONY)
IC403	8-752-006-10	s	CX20061(SONY)
IC404	8-741-125-80	s	BX1258(SONY)
IC501	8-752-006-10	s	CX20061(SONY)
IC502	8-759-969-13	s	SN16913P(TI)
IC503	8-759-145-58	s	uPC4558C(NEC)

Ref.No.	Parts No.	SP	Description
IC551	8-741-124-70	s	BX1247(SONY)
IC601	8-752-006-00	s	CX20060(SONY)
L401	1-407-492-00	s	1mH
L551	1-407-492-00	s	1mH
LV201	1-407-570-00	s	15uH
LV202	1-407-570-00	s	15uH
LV203	1-407-569-00	s	10uH
Q1	8-729-271-23	s	2SC2712
Q2	8-729-271-23	s	2SC2712
Q3	8-729-271-23	s	2SC2712
Q4	8-729-216-22	s	2SA1162
Q6	8-729-271-23	s	2SC2712
Q7	8-729-271-23	s	2SC2712
Q51	8-729-113-34	s	2SB733-5
Q52	8-729-271-23	s	2SC2712
	(S/N:10191 and higher)		
Q101	8-729-271-23	s	2SC2712
Q102	8-729-271-23	s	2SC2712
Q103	8-729-216-22	s	2SA1162
Q104	8-729-271-23	s	2SC2712
Q105	8-729-271-23	s	2SC2712
Q106	8-729-271-23	s	2SC2712
Q107	8-729-271-23	s	2SC2712
Q108	8-729-271-23	s	2SC2712
Q109	8-729-271-23	s	2SC2712
Q110	8-729-271-23	s	2SC2712
Q111	8-729-271-23	s	2SC2712
Q112	8-729-216-22	s	2SA1162
Q113	8-729-216-22	s	2SA1162
Q114	8-729-271-23	s	2SC2712
Q115	8-729-216-22	s	2SA1162
Q116	8-729-271-23	s	2SC2712
Q117	8-729-271-23	s	2SC2712
Q118	8-729-216-22	s	2SA1162
Q119	8-729-271-23	s	2SC2712
Q120	8-729-271-23	s	2SC2712
Q121	8-729-271-23	s	2SC2712
Q122	8-729-400-76	s	2SD1030
Q123	8-729-271-23	s	2SC2712
Q124	8-729-271-23	s	2SC2712
Q201	8-729-271-23	s	2SC2712
Q202	8-729-271-23	s	2SC2712
Q203	8-729-400-76	s	2SD1030
Q204	8-729-271-23	s	2SC2712
Q205	8-729-175-73	s	2SC2757
Q206	8-729-271-23	s	2SC2712
Q207	8-729-603-50	s	2SC403SP
Q208	8-729-271-23	s	2SC2712
Q209	8-729-200-71	s	2SC2712G
Q213	8-729-400-76	s	2SD1030
	(S/N:10191 and higher)		
Q301	8-729-271-23	s	2SC2712
Q302	8-729-216-22	s	2SA1162
Q303	8-729-271-23	s	2SC2712
Q304	8-729-216-22	s	2SA1162
Q306	8-729-271-23	s	2SC2712
Q307	8-729-216-22	s	2SA1162
Q401	8-729-603-50	s	2SC403SP
Q402	8-729-271-23	s	2SC2712
Q403	8-729-271-23	s	2SC2712
Q404	8-729-271-23	s	2SC2712
Q405	8-729-200-71	s	2SC2712G
Q406	8-729-201-05	s	2SC2878-B
Q407	8-729-271-23	s	2SC2712
Q408	8-729-271-23	s	2SC2712
Q409	8-729-271-23	s	2SC2712
Q410	8-729-271-23	s	2SC2712
Q412	8-729-216-22	s	2SA1162
Q501	8-729-271-23	s	2SC2712
Q502	8-729-400-76	s	2SD1030
Q503	8-729-201-05	s	2SC2878-B
Q551	8-729-271-23	s	2SC2712
Q552	8-729-271-23	s	2SC2712
R23	1-215-459-00	s	METAL 39k 1% 1/6W
R25	1-215-470-00	s	METAL 110k 1% 1/6W
R54	1-215-394-00	s	METAL 75 1% 1/6W
R55	1-215-394-00	s	METAL 75 1% 1/6W
R101	1-215-408-00	s	METAL 300 1% 1/6W
R103	1-215-416-00	s	METAL 620 1% 1/6W
R120	1-215-442-00	s	METAL 7.5k 1% 1/6W
R122	1-215-397-00	s	METAL 100 1% 1/6W
R131	1-215-414-00	s	METAL 510 1% 1/6W
R133	1-215-406-00	s	METAL 240 1% 1/6W
R136	1-215-414-00	s	METAL 510 1% 1/6W
R143	1-215-487-00	s	METAL 560k 1% 1/6W
R148	1-215-424-00	s	METAL 1.3k 1% 1/6W
R149	1-215-408-00	s	METAL 300 1% 1/6W
R176	1-215-416-00	s	METAL 620 1% 1/6W
R213	1-215-414-00	s	METAL 510 1% 1/6W
R214	1-215-405-00	s	METAL 220 1% 1/6W
R217	1-215-434-00	s	METAL 3.6k 1% 1/6W
R225	1-215-417-00	s	METAL 680 1% 1/6W
	(S/N:up to 10020)		
R226	1-215-415-00	s	METAL 560 1% 1/6W
	(S/N:up to 10020)		
R228	1-215-421-00	s	METAL 1k 1% 1/6W
R239	1-215-394-00	s	METAL 75 1% 1/6W
R242	1-215-428-00	s	METAL 2k 1% 1/6W
R301	1-215-408-00	s	METAL 300 1% 1/6W
R302	1-215-424-00	s	METAL 1.3k 1% 1/6W
R303	1-215-414-00	s	METAL 510 1% 1/6W
R304	1-215-414-00	s	METAL 510 1% 1/6W
R305	1-215-421-00	s	METAL 1k 1% 1/6W
R306	1-215-421-00	s	METAL 1k 1% 1/6W
R313	1-215-422-00	s	METAL 1.1k 1% 1/6W
R315	1-215-428-00	s	METAL 2k 1% 1/6W
R318	1-215-422-00	s	METAL 1.1k 1% 1/6W
R321	1-215-421-00	s	METAL 1k 1% 1/6W
R322	1-215-420-00	s	METAL 910 1% 1/6W
R331	1-215-419-00	s	METAL 820 1% 1/6W
R403	1-215-431-00	s	METAL 2.7k 1% 1/6W
R412	1-215-429-00	s	METAL 2.2k 1% 1/6W
R427	1-215-460-00	s	METAL 43k 1% 1/6W
R440	1-215-421-00	s	METAL 1k 1% 1/6W
R451	1-215-424-00	s	METAL 1.3k 1% 1/6W
R558	1-215-408-00	s	METAL 300 1% 1/6W
R559	1-215-426-00	s	METAL 1.6k 1% 1/6W

Ref.No.	Parts No.	SP	Description
RV1	1-228-890-00	s	VAR,METAL 4.7k
RV51	1-228-888-00	s	VAR,METAL 1k
RV101	1-228-891-00	s	VAR,METAL 10k
RV102	1-228-892-00	s	VAR,METAL 22k
RV103	1-228-888-00	s	VAR,METAL 1k
RV104	1-228-888-00	s	VAR,METAL 1k
RV105	1-228-888-00	s	VAR,METAL 1k
RV106	1-228-890-00	s	VAR,METAL 4.7k
RV107	1-228-896-00	s	VAR,METAL 220k
RV108	1-228-890-00	s	VAR,METAL 4.7k
RV109	1-228-890-00	s	VAR,METAL 4.7k
RV110	1-228-892-00	s	VAR,METAL 22k
RV111	1-228-887-00	s	VAR,METAL 470
RV201	1-228-887-00	s	VAR,METAL 470
RV202	1-228-887-00	s	VAR,METAL 470
RV203	1-228-888-00	s	VAR,METAL 1k
RV204	1-228-888-00	s	VAR,METAL 1k
RV205	1-228-892-00	s	VAR,METAL 22k
RV206	1-228-888-00	s	VAR,METAL 1k
RV207	1-228-888-00	s	VAR,METAL 1k
RV208	1-228-456-00 (S/N:10021 and higher)	s	VAR,CERMET 1k
RV301	1-228-888-00	s	VAR,METAL 1k
RV304	1-228-890-00	s	VAR,METAL 4.7k
RV305	1-228-890-00	s	VAR,METAL 4.7k
RV306	1-228-889-00	s	VAR,METAL 2.2k
RV307	1-228-889-00	s	VAR,METAL 2.2k
RV401	1-228-890-00	s	VAR,METAL 4.7k
RV402	1-228-890-00	s	VAR,METAL 4.7k
RV501	1-228-895-00	s	VAR,METAL 100k
RV502	1-228-888-00	s	VAR,METAL 1k
RV503	1-228-889-00	s	VAR,METAL 2.2k
RV504	1-228-890-00	s	VAR,METAL 4.7k
SW1	1-552-509-00	s	DIP"CONVENTIONAL/SP"
X301	1-567-142-11	s	OSC,CRYSTAL 13.3MHz

YC-20 BOARD

Ref.No.	Parts No.	SP	Description
	A-6711-651-A	o	MOUNTED CIRCUIT BOARD,YC-20
C5	1-107-044-00	s	MICA 3.3PF 0.5PF 500V
C102	1-107-165-00	s	MICA 56PF 5% 500V
C222	1-107-159-00	s	MICA 33PF 5% 500V
C243	1-107-211-00	s	MICA 24PF 5% 500V
D1	8-719-162-07	s	RD6.2E
DL101	1-415-404-11	s	113mS
DL201	1-415-404-11	s	113mS
FB101	1-535-178-00	s	FERRITE
FB201	1-535-178-00	s	FERRITE
FB202	1-535-178-00	s	FERRITE
FB203	1-535-178-00	s	FERRITE
FB205	1-535-178-00	s	FERRITE
FB206	1-535-178-00	s	FERRITE
FL1	1-235-475-11	s	LOW PASS
FL201	1-235-476-11	s	BAND PASS
IC1	8-743-890-00	s	BX389(SONY)
IC101	8-752-201-30	s	CX22013(SONY)
IC102	8-743-890-00	s	BX389(SONY)
IC201	8-743-890-00	s	BX389(SONY)
IC202	8-743-890-00	s	BX389(SONY)
IC203	8-743-890-00	s	BX389(SONY)
Q1	8-729-271-22	s	2SC2712G
Q2	8-729-271-22	s	2SC2712G
Q3	8-729-271-22	s	2SC2712G
Q101	8-729-271-22	s	2SC2712G
Q102	8-729-271-22	s	2SC2712G
Q103	8-729-271-22	s	2SC2712G
Q201	8-729-271-22	s	2SC2712G
Q202	8-729-271-22	s	2SC2712G
Q203	8-729-271-22	s	2SC2712G
Q204	8-729-271-22	s	2SC2712G
Q205	8-729-175-73	s	2SC2757
Q206	8-729-175-73	s	2SC2757
Q207	8-729-175-73	s	2SC2757
Q208	8-729-175-73	s	2SC2757
Q209	8-729-122-63	s	2SA1226
Q210	8-729-122-63	s	2SA1226
Q211	8-729-122-63	s	2SA1226
Q212	8-729-122-63	s	2SA1226
Q213	8-729-271-22	s	2SC2712G
Q214	8-729-175-73	s	2SC2757
Q215	8-729-175-73	s	2SC2757
Q216	8-729-122-63	s	2SA1226
Q217	8-729-122-63	s	2SA1226
Q218	8-729-175-73	s	2SC2757
Q219	8-729-122-63	s	2SA1226
Q220	8-729-122-63	s	2SA1226
Q221	8-729-175-73	s	2SC2757
Q222	8-729-175-73	s	2SC2757
Q223	8-729-122-63	s	2SA1226
Q224	8-729-271-22	s	2SC2712G
Q225	8-729-271-22	s	2SC2712G
R4	1-214-558-00	s	METAL 1.1k 1% 1/8W
R5	1-214-550-00	s	METAL 510 1% 1/8W
R6	1-214-557-00	s	METAL 1k 1% 1/8W
R7	1-214-557-00	s	METAL 1k 1% 1/8W
R8	1-214-556-00	s	METAL 910 1% 1/8W

Ref.No.	Parts No.	SP	Description
R9	1-214-552-00	s	METAL 620 1% 1/8W
R10	1-214-557-00	s	METAL 1k 1% 1/8W
R11	1-214-556-00	s	METAL 910 1% 1/8W
R16	1-214-574-00	s	METAL 5.1k 1% 1/8W
R101	1-214-560-00	s	METAL 1.3k 1% 1/8W
R108	1-214-541-00	s	METAL 220 1% 1/8W
R109	1-214-541-00	s	METAL 220 1% 1/8W
R205	1-214-541-00	s	METAL 220 1% 1/8W
R206	1-214-541-00	s	METAL 220 1% 1/8W
R274	1-214-550-00	s	METAL 510 1% 1/8W
R275	1-214-550-00	s	METAL 510 1% 1/8W
RV1	1-228-887-00	s	VAR,METAL 470
RV101	1-228-891-00	s	VAR,METAL 10k
RV201	1-228-887-00	s	VAR,METAL 470
RV202	1-228-887-00	s	VAR,METAL 470
RV203	1-228-887-00	s	VAR,METAL 470
RV204	1-228-889-00	s	VAR,METAL 2.2k
RV205	1-228-888-00	s	VAR,METAL 1k
RV206	1-228-887-00	s	VAR,METAL 470
RV207	1-228-887-00	s	VAR,METAL 470
RV208	1-228-887-00	s	VAR,METAL 470
S201	1-554-076-00	s	SLIDE"PROCESS"

FRAME

	1-586-633-11	s	CONDENSATION SENSOR
CN1001	1-509-184-31	s	RECEPTACLE XLR 3P(F) "MIC CH-1 IN"
CN1002	1-509-184-31	s	RECEPTACLE XLR 3P(F) "MIC CH-2 IN"
CN1003	1-560-999-11	s	CONNECTOR WITH SW "DC IN"
CN1005	1-561-040-00	s	RECEPTACLE 14P "CAMERA"
CN1006	1-507-251-xx	s	JACK "EARPHONE"
CN1007	1-509-176-31	s	RECEPTACLE XLR 3P(M) "AUDIO CH-1 OUT"
CN1008	1-509-176-31	s	RECEPTACLE XLR 3P(M) "AUDIO CH-2 OUT"
CN1009	1-561-781-51	s	BNC "VIDEO OUT 1"
CN1010	1-561-781-51	s	BNC "VIDEO OUT 2"
CN1011	1-507-195-	s	JACK "REMOTE"
CN1012	1-561-781-51	s	BNC "LINE VIDEO IN"
CN1013	1-561-781-61	s	BNC "OFF TAPE OUT"
CN1014	1-561-781-61	s	BNC "EXT SC IN"
CN1015	1-561-781-61	s	BNC "TC IN"
CN1016	1-561-781-61	s	BNC "TC OUT"
CN1017	1-507-626-00	s	JACK POWER OUTSIDE "BATT"
H1001	A-6709-509-A	s	DUH-29A-R DRUM ASSY
	A-6709-516-A	s	DUR-29-R UPPER DRUM ASSY
H1002	8-825-578-20	s	EPS264-5803 "CTL R/P AUDIO CH-1 ERASE/ AUDIO CH-1/CH-2 R/P"
H1003	8-825-544-20	s	EF248-58 "FULL ERASE"
H1004	8-829-371-11	s	PP171-5802D "TIME CODE"
M1001	8-838-079-01	s	DC BHF-1913A "CAPSTAN"
M1002	8-835-123-01	s	DC MNR-7400A "REEL"
M1003	1-541-163-00	s	DC "THREADING"
M1004	8-835-030-01	s	DC MNR-2900A "DRUM"
ME1001	1-520-482-21	s	AUDIO "CH-1/VIDEO LEVEL/BATTERY" WITH PILOT LAMP
ME1002	1-520-482-11	s	AUDIO "CH-2 LEVEL" WITH PILOT LAMP

Ref.No.	Parts No.	SP	Description
PM1001	1-454-386-11	s	"PINCH"
PM1002	1-454-383-11	s	"T-BRAKE"
PM1003	1-454-382-11	s	"TENREG"
PM1004	1-454-383-11	s	"S-BRAKE"
PM1005	1-454-381-11	s	"T-IDLER"
PM1006	1-454-381-11	s	"S-IDLER"
RV1001	1-230-894-11	s	VAR,CARBON 10K"AUDIO CH-1 REC REVEL"
RV1002	1-230-894-11	s	VAR,CARBON 10K"AUDIO CH-2 REC LEVEL"
S1001	1-553-246-00	s	TOGGLE,"POWER"
S1002	1-570-028-11	s	MICRO "CASSETTE IN"
S1003	1-570-028-11	s	MICRO "MISS REC"
S1004	1-570-028-21	s	MICRO "CASSETTE LOCK"
S1005	1-570-028-11	s	MICRO "THREAD END"
S1006	1-570-028-11	s	MICRO "EJECT"
S1007	1-570-028-11	s	MICRO "UNTHREAD END"
S1008	1-570-028-21	s	MICRO "SP"
S1009	1-514-459-11	s	SLIDE "DOLBY"
S1010	1-570-028-11	s	MICRO "CASSETTE LOCK" (S/N:10021 and higher)

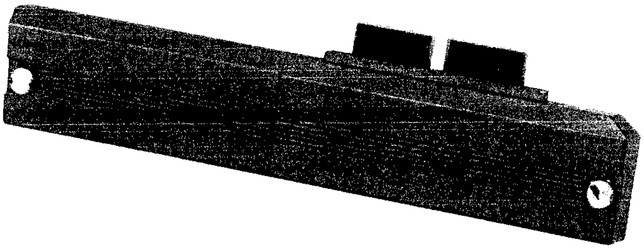
17-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

Part No.	SP	Description
A-6765-908-A	s	HANDLE ASSY
X-3694-703-1	s	KNOB (B) ASSY, VOL
2-249-503-03	o	BELT, SHOULDER
3-662-756-02	o	BELT, SHOULDER
3-694-785-01	o	CUSHION (UPPER)
3-694-786-01	o	CUSHION (LOWER)
3-694-787-01	o	INDIVIDUAL CARTON
3-694-788-01	o	BOX, ACCESSORY
3-694-789-01	o	CASE CARRYING
3-701-616-00	s	BAG, POLY (FOR KNOB)
3-701-632-00	s	BAG, POLY (FOR MANUAL)
4-885-820-00	s	BAG, PROTECTION

SONY®

TIME CODE GENERATOR

BKU-150/150P



OPERATION AND MAINTENANCE MANUAL
1st Edition (Revised 1)
Serial No. 10001 and Higher (USA, CANADA, JAPAN)
Serial No. 10001 and Higher (EK)

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第１章
取り扱い操作

BKU-150はENG記録／再生用ポータブルビデオカセットレコーダーBVU-150に取り付けて使用する小型タイムコードジェネレーターです。本機をレコーダーに接続することによって，録画中テープのアドレストラックにLTC（Longitudinal Time Code）タイムコードを自動的に記録することができます。垂直ブランキング期間に任意のラインを２本選んでVITC（Vertical Interval Time Code）タイムコードを記録することもできます。

1-1. 特長

小型，簡単な接続
差し込み式のカードプラグでポータブルビデオカセットレコーダーBVU-150に簡単に接続して使用できます。

F-RUN／R-RUNモードの切り換え
タイムコードのカウントを継続的に行うか，録画時のみカウントするか設定が可能です。

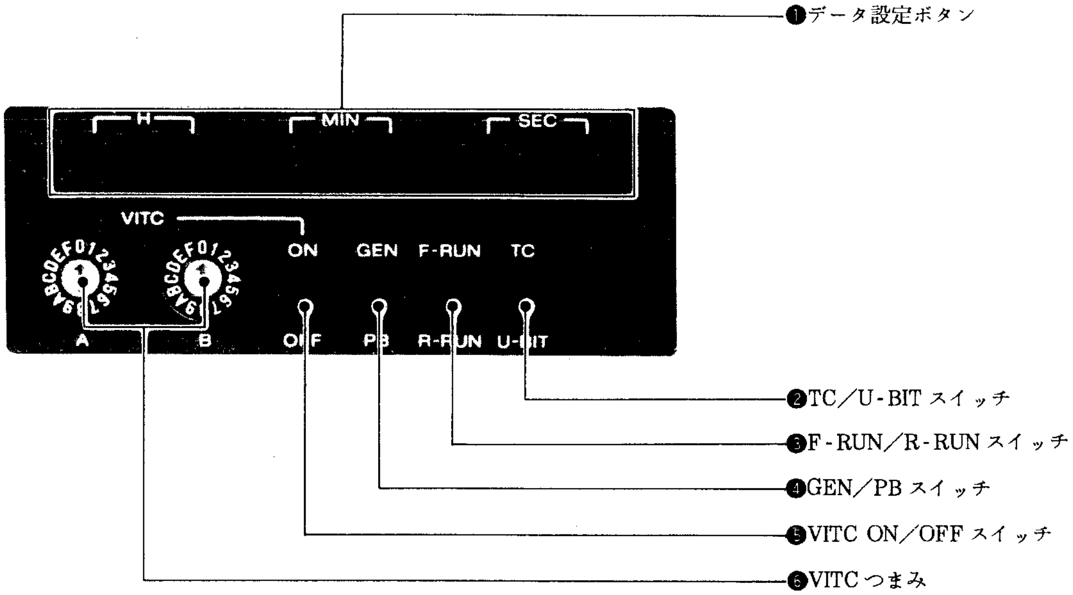
VITCの挿入
垂直ブランキング期間の任意の２ラインにタイムコードの記録ができます。

ユーザービットの設定
ユーザービットに任意のデータを６桁の16進数で入力できます。

タイムコードリーダーの内蔵
BKU-150は１倍速の再生時に長手方向のタイムコード（LTC）を読み出し，タイムコードまたはユーザービットのデータを表示します。

外部タイムコードにスレーブロック可能
ジェネレーターを外部タイムコードにスレーブロックさせることができます。

1-2.　各部の名称と説明



❶ データ設定ボタン

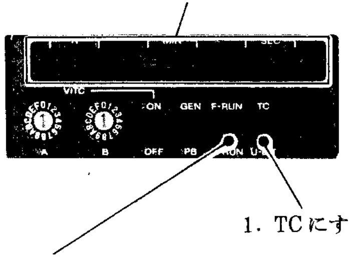
BVU-150が録画以外の状態でGEN／PBスイッチ❹をGENにし，F-RUN／R-RUNスイッチ❸をR-RUNにしてからデータを設定します。

TC／U-BITスイッチ❷がTCのときはタイムコードを，U-BITのときはユーザービットを設定できます。

タイムコードの設定

データはH(時)，MIN(分)，SEC(秒)の3桁から成り，最大23時間59分59秒まで設定できます。

3．データを設定する。



1．TCにする。

2．R-RUNにする。

4．必要に応じて切り換える。
　F-RUN：タイムコードの歩進がすぐに開始される。
　R-RUN：記録中のみタイムコードが歩進する。

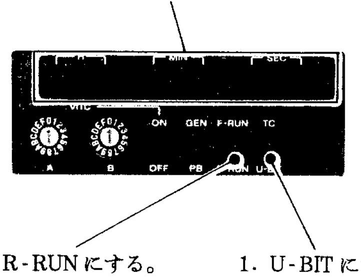
ユーザービットの設定

設定されたデータは録画時にタイムコードと同時に記録されます。

ユーザービットの各桁は16進表示となり，データ10～15は通常のA～Fとは異なり，次表のようになります。

	10	11	12	13	14	15
16 進 数	A	B	C	D	E	F
シンボル	L	H	P	A	-	(無表示)

3．データを設定する。



2．R-RUNにする。　　1．U-BITにする。

タイムコードを表示するときはTC／U-BITスイッチをTCにします。

ご注意

TC／U-BITスイッチを切り換えることによってタイムコードとユーザービットを続けて設定できます。
ただし，タイムコードをF-RUNでカウントするときは，ユーザービットの設定を先に済ませてください。
(ユーザービットを設定する際R-RUNに切り換えると，タイムコードの歩進は止まってしまいます。)

❷ TC／U-BIT（タイムコード／ユーザービット）スイッチ

BVU-150の表示窓に表示するデータを選びます。

TC： タイムコード

U-BIT： ユーザービット

- タイムコード表示の場合，表示されるデータの切り換え（ジェネレーターまたはリーダー）はGEN／PBスイッチ❹で行います。
- データを設定するときもこのスイッチでタイムコードかユーザービットを選択します。

❸ F-RUN／R-RUN（フリーラン／レコードラン）スイッチ

F-RUN： 入力ビデオ信号がなくても内蔵の発振器を基準にしてタイムコードはカウントを続けます。
入力ビデオ信号があるときは，その信号を基準にしてカウントされます。

R-RUN： BVU-150が録画時のみタイムコードがカウントされ，それ以外はカウントされません。

❹ GEN／PB（ジェネレーター／再生）スイッチ

GEN： BVU-150の表示窓にジェネレーターの発生するタイムコードかまたはユーザービットを表示します。

PB： リーダーに入力があれば，表示窓にリーダーが読み取ったデータを表示します。リーダーに入力がないときは，表示用メモリーに残っていた旧データを表示します。

❺ VITC ON／OFF（VITC記録入／切）スイッチ

VITCタイムコードを記録するときON，記録しないときOFFにします。

❻ VITC（VITCライン設定）つまみ

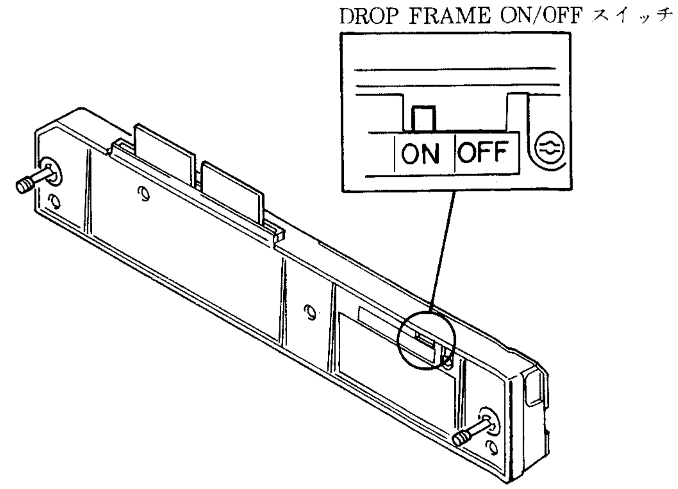
VITCを記録する挿入ラインを選ぶとき，つまみを下表のように切り換えます。

A，Bの両つまみはそれぞれ独立で機能するため，2本の異なるラインにタイムコードを記録することができます。

スイッチ位置	VITC挿入ラインNo.
0	ライン10
1	11
2	12
3	13
⇨ 4	14
5	15
⇨ 6	16
7	17
8	18
9	19
A	20
B	21
C	22
D	23
E	24
F	25

注：⇨ は工場出荷時の標準設定位置。

裏面



DROP FRAME ON／OFF（ドロップフレーム入／切）スイッチ

発生するタイムコードのドロップフレームモード，ノンドロップフレームモードを選択します。

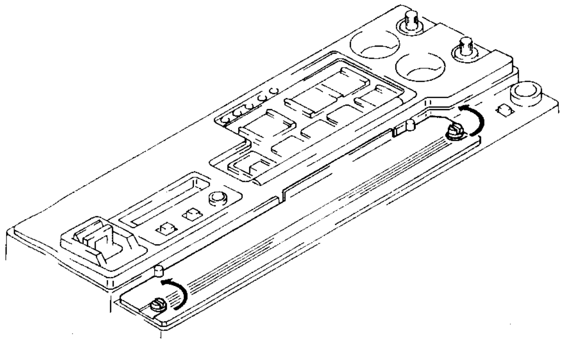
ON: ドロップフレームモード

OFF: ノンドロップフレームモード

出荷時はONに設定してあります。

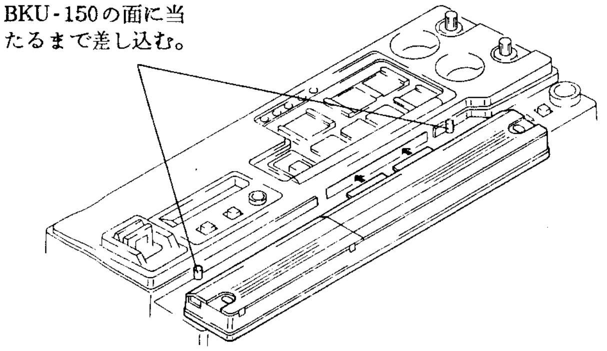
1-3. 接続

1. BVU-150からカバーを外します。

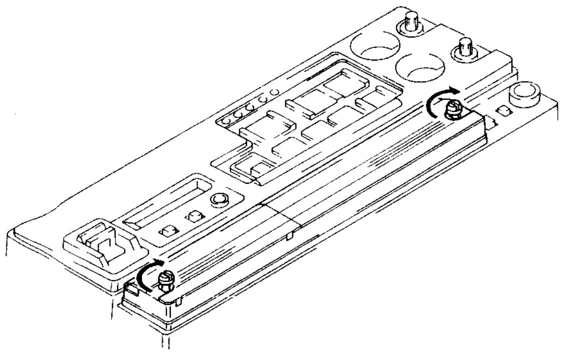


2. BKU-150のカードプラグをBVU-150に差し込みます。

突起が2つとも
BKU-150の面に当
たるまで差し込む。



3. BKU-150についているネジを締めます。



1-4. 主な仕様

構造	差し込み取り付け型(BVU-150用)
外形寸法	196×37×14 mm(幅／高さ／奥行き)
重量	130 g
消費電力	50 mW以下

仕様および外観は改良のため予告なく変更することがありますが，ご了承ください。

SECTION 1

OPERATION

The BKU-150/150P time code generator is designed for use with the BVU-150/150P portable video cassette recorder.
When the BKU-150/150P is connected to the BVU-150/150P, the LTC (Longitudinal Time Code) is automatically recorded on the tape address track. External controls allow selection of the VITC (Vertical Interval Time Code) recording. Time data and user bits data from the BKU-150/150P is indicated by the VTR display.

1-1. FEATURES

Compact design and easy connection
The BKU-150/150P attaches easily to the BVU-150/150P portable video cassette recorder with simple plug-in type connectors. Captive screws secure the module to the VTR.

Free-run/record-run mode selectable
The time code generator can be set to run continuously or to run only during recording.

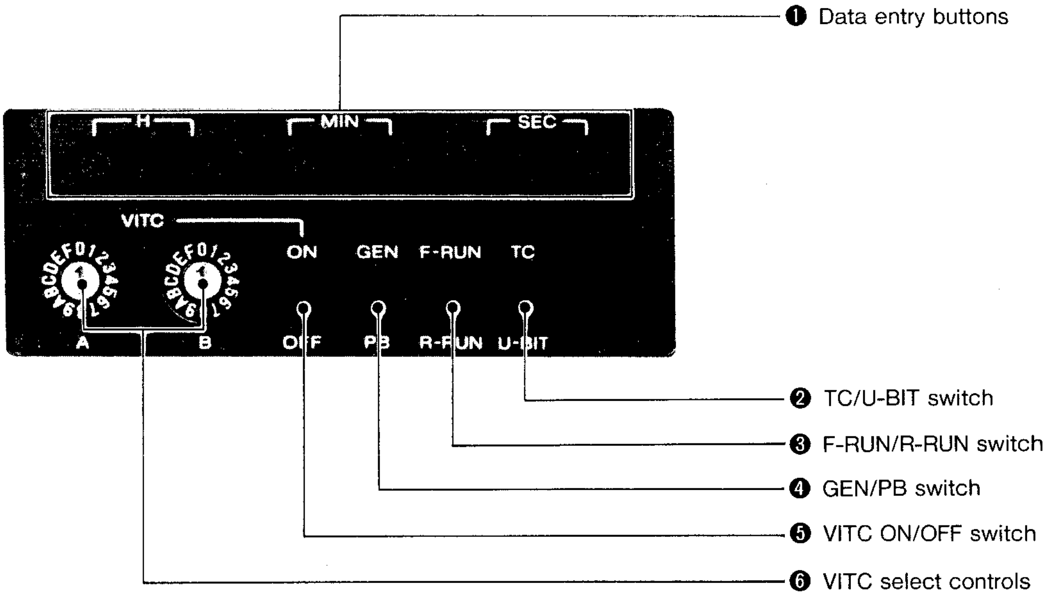
VITC (Vertical Interval Time Code) capability
The time data can be recorded on any two lines of the V-blanking interval.

User bits entry
A six digit hexadecimal number can be entered as user bits data.

Time code reader incorporated
The BKU-150/150P reads the longitudinal time code at a normal bit rate (normal play speed). Both time data and user bits are displayed.

External time code with slave lock
The generator can be slave-locked to the external time data.

1-2. LOCATION AND FUNCTION OF CONTROLS



❶ Data entry buttons

These buttons allow entry of data with the GEN/PB switch ❹ set to GEN and the F-RUN/R-RUN switch ❸ set to R-RUN when the BVU-150/150P portable video cassette recorder is in a mode other than the record mode.

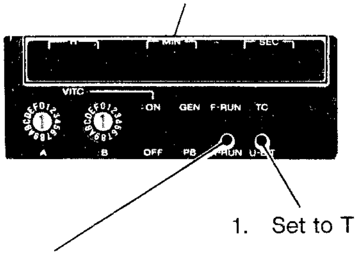
When the TC/U-BIT switch is set to TC, these buttons are used to set the time data and when the switch set to U-BIT, user bits can be set.

Setting time data

These buttons are used to set the H (hours), MIN (minutes) and SEC (seconds) digits.

The time can be preset for readouts of up to 23 hours, 59 minutes and 59 seconds.

3. Set the desired values with these buttons.



1. Set to TC.
2. Set to R-RUN.
4. Set to the desired mode; R-RUN or F-RUN.

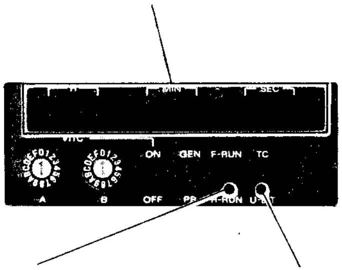
Setting user bits

During recording, a six-digit number set by these buttons is recorded with the time code data.

A special hexadecimal notation is used to display the user bits data: the symbols representing hexadecimal numbers A through F (of the conventional notation) are as follows.

	10	11	12	13	14	15
Hexadecimal number	A	B	C	D	E	F
Symbol	L	H	P	A	-	Blank

3. Set the desired values with these buttons.



2. Set to R-RUN.
1. Set to U-BIT.

Set to TC if it is necessary to display the generated time data.

Note: Time data and user bits can be set successively by changing the TC/U-BIT switch ❷. If the time data wants to be counted continuosly (F-RUN), set the user bits first. Otherwise, the time data will stop when the F-RUN/R-RUN switch ❸ is set to R-RUN for user bits setting.

❷ TC/U-BIT (time code/user bits) switch

Selects the data to be displayed on the BVU-150/150P portable video cassette recorder.

TC: The display shows the time data.

U-BIT: The display shows user bits information.

- The GEN/PB switch ❹ determines the source of the displayed data; the generator or the reader.
- This switch also selects either "time data" or "user bits" when entering data with the data entry buttons ❶ when the F-RUN/R-RUN switch ❸ is set to R-RUN.

❸ F-RUN/R-RUN (free-run/record-run) switch

F-RUN: The time data continues to be generated in reference to the clock generated by a built-in oscillator even if no video signal is input.
When a video signal is input, the generated time data is clocked by the time base of the video signal.

- Time data agrees with real time (clock time) only when the drop frame mode is selected. (For BVU-150

R-RUN: The time data is generated only when the connected BVU-150/150P is in the record mode; in other modes the last time data generated is displayed.

❹ GEN/PB (generator/playback) switch

GEN: The display of the BVU-150/150P portable video cassette recorder shows the time data or user bits information from the generator.

PB: The display shows new data from the reader. Otherwise, it shows the old data held in the display memory.

❺ VITC (Vertical Interval Time Code) ON/OFF switch

Set to ON to record VITC, and to OFF when VITC is not to be recorded.

❻ VITC (Vertical Interval Time Code) select controls

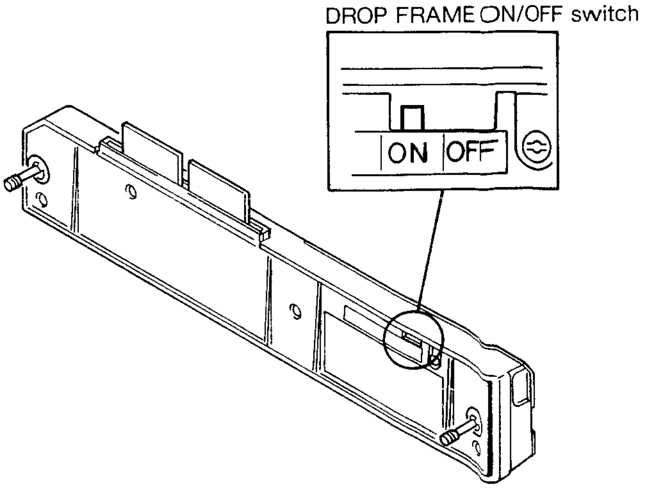
These controls select the V-blanking lines where VITC is to be inserted. (See the chart below.)

The A control and the B control function separately, allowing for insertion of the same VITC on two different lines.

	Switch setting	VITC insertion line No.	
		NTSC model	PAL model
	0	Line 10	Line 7
	1	11	8
	2	12	9
	3	13	10
⇨	4	14	11
	5	15	12
⇨	6	16	13
	7	17	14
	8	18	15
	9	19	16
	A	20	17
	B	21	18
	C	22	19
	D	23	20
	E	24	21
	F	25	22

Note: "⇨" indicates the factory-setting.

Rear panel (BKU-150 only)



DROP FRAME ON/OFF switch

Selects drop frame or non-drop frame of the generated time code.

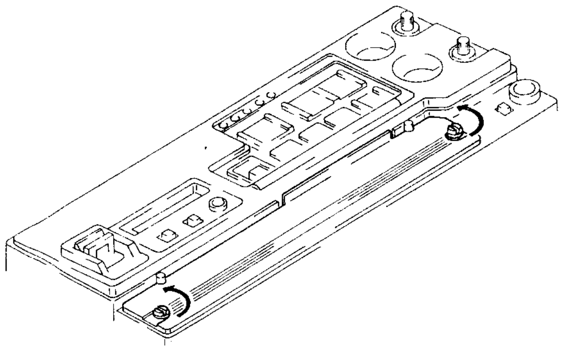
ON: Drop frame mode.

OFF: Non-drop frame mode.

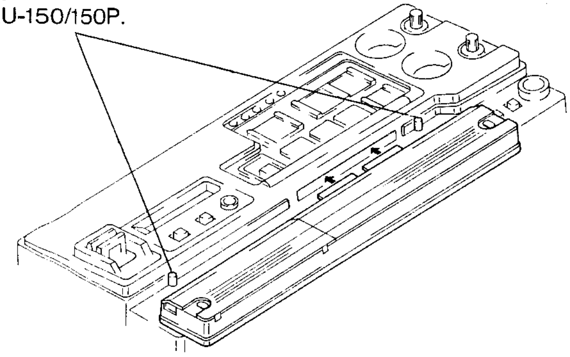
This switch is factory preset to ON.

1-3. CONNECTION TO THE BVU-150/150P

1. Remove the cover from the BVU-150/150P portable video cassette recorder.

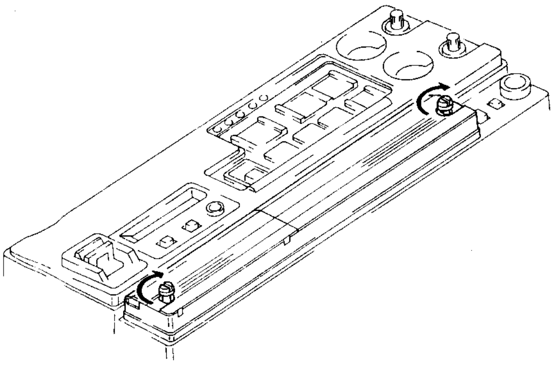


2. Plug the card edge connectors into the BVU-150/150P .



Insert fully until the two projections touch the BKU-150/150P.

3. Secure the BKU-150/150P with the captive screws.



1-4. SPECIFICATIONS

Construction	Plug-in unit, for BVU-150/150P
Dimensions	196 × 37 × 14 mm (w/h/d) ($7\frac{3}{4} \times 1\frac{1}{2} \times \frac{9}{16}$ inches)
Weight	130 g (5 oz)
Power consumption	Less than 50 mW

Design and specifications subject to change without notice.

TEIL 1
BETRIEB

Der BKU-150P ist ein für den portablen Videorecorder BVU-150P ausgelegter Zeitcode-Gernerator. Bei Anschluß des BKU-150P an den BVU-150P wird der Longitudinal-Zeitcode (LTC) automatisch auf die Adreßspur des Bandes aufgezeichnet. Externe Schalter ermöglichen eine beliebige Einfügung des Vertikalintervall-Zeitcodes (VITC). Zeitcode- und Benutzer-Bit-Daten des BKU-150P werden in einem Flüssigkristall-Display angezeigt.

1-1. BESONDERE MERKMALE

Kompaktes Design und einfacher Anschluß
Die Zusammenschaltung des BKU-150P mit dem portablen Videorecorder BVU-150P erfolgt mit praktischen Steckverbindern. Halteschrauben sichern die Einheit am Videorecorder.

Umschaltmöglichkeit zwischen Freilauf und Aufnahmelauf
Der Zeitcode kann entweder kontinuierlich (Freilauf) oder nur beim Aufnehmen (Aufnahmelauf) aufgezeichnet werden.

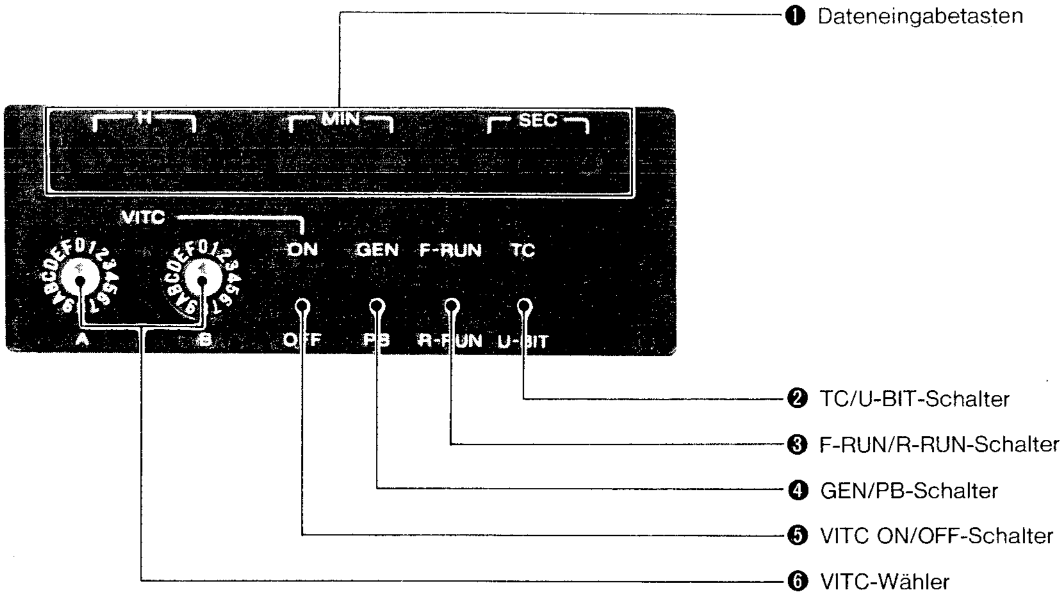
Aufzeichnungsmöglichkeit des Vertikalintervall-Zeitcodes (VITC)
Die Aufzeichnung des Zeitcodes kann in zwei beliebige Zeilen der V-Austastlücke erfolgen.

Einstellungsmöglichkeit von Benutzer-Bit-Daten
Als Benutzer-Bit kann eine sechsstellige Hexadezimalzahl eingegeben werden.

Eingebauter Zeitcode-Leser
Der BKU-150P kann den Longitudinal-Zeitcode mit normaler Bit-Rate (bei normaler Wiedergabegeschwindigkeit) lesen und die Zeitcode- sowie die Benutzer-Bit-Daten anzeigen.

Externer Zeitcode mit Slave-Lock
Der Generator kann wahlweise auch mit einem externen Zeitcode verriegelt werden.

1-2. LAGE UND FUNKTION DER BEDIENUNGSELEMENTE



❶ Dateneingabetasten

Diese Tasten ermöglichen eine Dateneingabe, wenn der GEN/PB-Schalter ❹ auf GEN und der F-RUN/R-RUN-Schalter ❸ auf R-RUN gestellt ist. Der Videorecorder BVU-150P darf sich hierbei jedoch nicht in der Aufnahme-Funktion befinden.

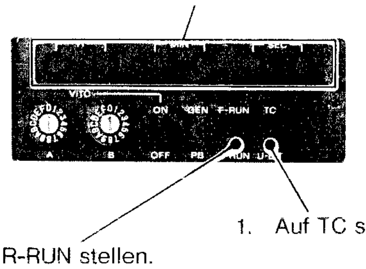
Steht der TC/U-BIT-Schalter auf TC, so dienen diese Tasten zur Einstellung des Zeitcodes, und steht der Schalter auf U-BIT, so dienen sie zur Einstellung der Benutzer-Bits.

Einstellung des Zeitcodes

Die Dateneingabetasten dienen zur Einstellung der Stunden (H), Minuten (MIN) und Sekunden (SEC).

Als Zeit kann maximal 23 Stunden, 59 Minuten und 59 Sekunden eingestellt werden.

3. Mit diesen Tasten die gewünschten Werte einstellen.



1. Auf TC stellen.
2. Auf R-RUN stellen.
4. Auf die gewünschte Betriebsart stellen: R-RUN oder F-RUN.

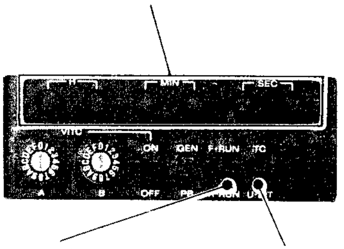
Einstellung der Benutzer-Bits

Mit den Dateneingabetasten kann während der Aufnahme eine sechsstellige Zahl eingegeben und zusammen mit dem Zeitcode aufgezeichnet werden.

Zur Anzeige der Benutzer-Bit-Daten werden die Buchstaben A bis F verwendet, die wie folgt dem normalen Hexadezimal-Code entsprechen.

	10	11	12	13	14	15
Hexadezimal-Code	A	B	C	D	E	F
Buchstabe	[illegible]	[illegible]	[illegible]	[illegible]		Frei

3. Mit diesen Tasten die gewünschten Werte einstellen.



2. Auf R-RUN stellen.
1. Auf U-BIT stellen.

Auf TC stellen, wenn der erzeugte Zeitcode angezeigt werden soll.

Hinweis: Zeitcode und Benutzer-Bit können nacheinander durch Umstellen des TC/U-BIT-schalters ❷ eingestellt werden. Wenn der Zeitcode kontinuierlich gezählt werden soll (F-RUN), stellen Sie die Benutzer-Bits zuerst ein. Ansonsten stoppt der Zeitcode, wenn der F-RUN/R-RUN-Schalter ❸ zum Setzen des Benutzer-Bits auf R-RUN gestellt wird.

❷ Umschalter für Zeitcode/Benutzer-Bit (TC/U-BIT)

Zur Wahl der am portablen Videorecorder BVU-150P angezeigten Daten.

TC: Zur Anzeige des Zeitcodes.

U-BIT: Zur Anzeige der Benutzer-Bit-Daten.

- Mit dem GEN/PB-Schalter ❹ kann festgelegt werden, ob die Daten des Generators oder des Lesers angezeigt werden.
- Bei der Dateneingabe mit den Dateneingabetasten ❶ dient dieser Schalter ebenfalls zur Wahl zwischen „Zeitcode" und „Benutzer-Bit", wenn der F-RUN/R-RUN-Schalter ❸ auf R-RUN gestellt ist.

❸ Schalter für Freilauf/Aufnahmelauf (F-RUN/R-RUN)

F-RUN: Auch wenn kein Videosignal zugeleitet wird, wird ein mit dem eingebauten Oszillator synchronisierter Zeitcode erzeugt.

Bei Zuleitung eines Videosignals dient dieses als Synchronisationsbasis für den erzeugten Zeitcode.

R-RUN: Der Zeitcode wird nur erzeugt, wenn der BVU-150P auf Aufnahme geschaltet ist; in den anderen Betriebsarten wird der zuletzt erzeugte Zeitcode angezeigt.

❹ Generierungs/Wiedergabe-Umschalter (GEN/PB)

GEN: Das Display des portablen Videorecorders BVU-150P zeigt die Zeitcode- oder Benutzer-Bit-Daten des Generators.

PB: Das Display zeigt die vom Leser gelesenen neuen Daten, und ansonsten die im Display-Speicher gehaltenen alten Daten.

❺ Ein/Aus-Schalter für Vertikalintervall-Zeitcode (VITC ON/OFF)

Wenn der VITC aufgenommen werden soll, stellen Sie diesen Schalter auf ON, und wenn er nicht aufgenommen werden soll, auf OFF.

❻ Wahlschalter für Vertikalintervall-Zeitcode (VITC)

Mit diesen beiden Schaltern werden die Zeilen gewählt, in die der VITC eingefügt wird. (Siehe Tabelle unten.)

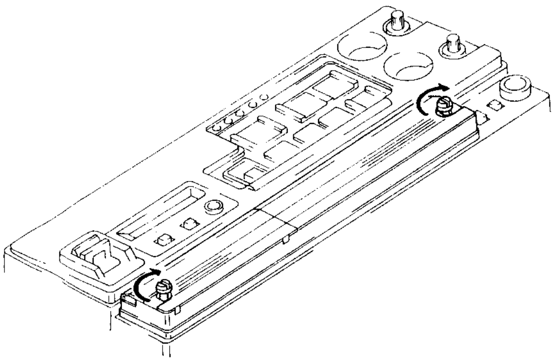
Die Schalter A und B arbeiten unabhängig voneinander, so daß der gleiche VITC in zwei verschiedene Zeilen eingefügt werden kann.

	Schalterstellung	Zeilen-Nr. des VITC
	0	Zeile 7
	1	8
	2	9
	3	10
⇨	4	11
	5	12
⇨	6	13
	7	14
	8	15
	9	16
	A	17
	B	18
	C	19
	D	20
	E	21
	F	22

Hinweis: „⇨" zeigt die werkseitige Einstellung.

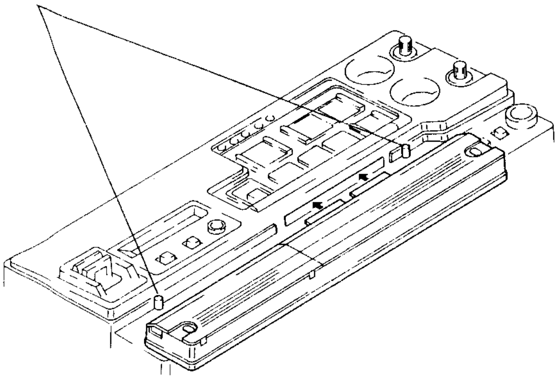
1-3. ANSCHLUSS DES BVU-150P

1. Nehmen Sie die Abdeckung vom portablen Videorecorder BVU-150P ab.

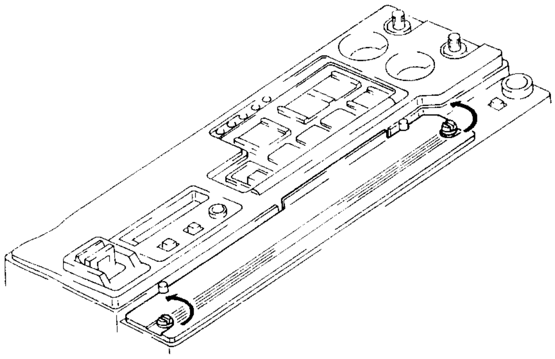


2. Stecken Sie die Anschlüsse in den BVU-150P ein.

Ganz einstecken, so daß die beiden Vorsprünge den BKU-150P berühren.



3. Den BKU-150P mit den Halteschrauben befestigen.



1-4. TECHNISCHE DATEN

Konstruktion	Steckbarer Typ für BVU-150P
Abmessungen	196 × 37 × 14 mm (B/H/T)
Gewicht	130 g
Leistungsaufnahme	unter 50 mW

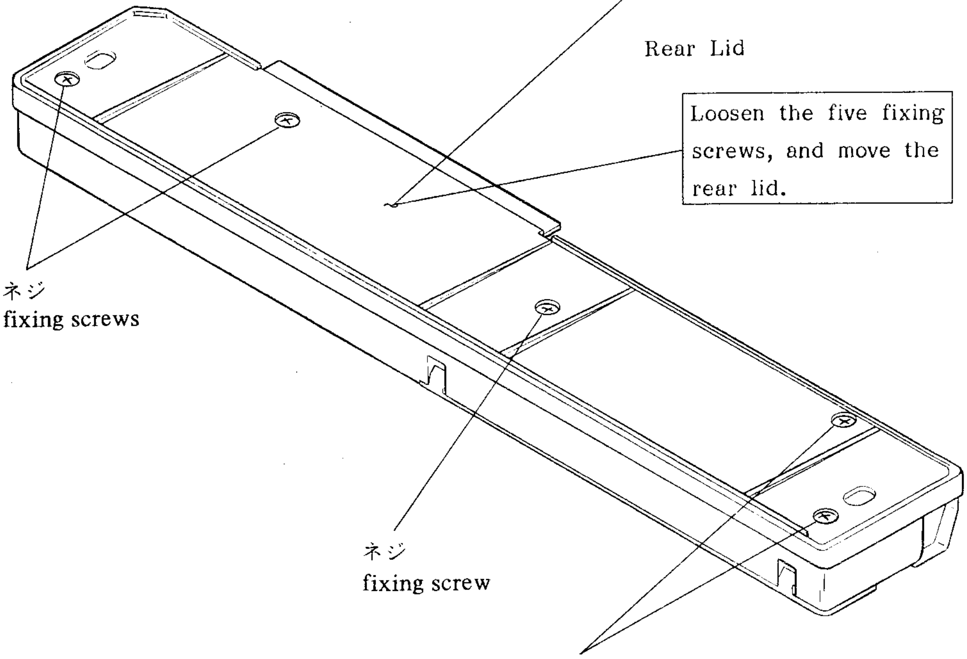
Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

(2)

SECTION 2
SERVICE INFORMATION

2−1.　外装の取り外し

2-1. CABINET REMOVAL PROCEDURES



2—2. サービス部品

1. パーツセンターから供給される部品は，実際にセットに使用している部品と形状が異なることが時々あります。これらは「部品の共通化」等によるものです。
2. 分解図，電気部品リスト中SP欄がSで示されている部品は常時在庫します。SP欄がOで示されている部品は交換頻度が低い部品ですので，在庫していないことがあり，納期が長くなることがあります。

2-2. SPARE PARTS

1. Replacement Parts supplied from the Sony Parts Center will sometimes have a different shape from the original parts. These differences are for accommodating improved parts and/or engineering changes or standardization of genuine parts.
   This manual's exploded views and electrical spare parts list indicate the part numbers of the standardized genuine parts at the present time. Regarding engineering part changes in our engineering department, refer to Sony service bulletins and service manual supplements.

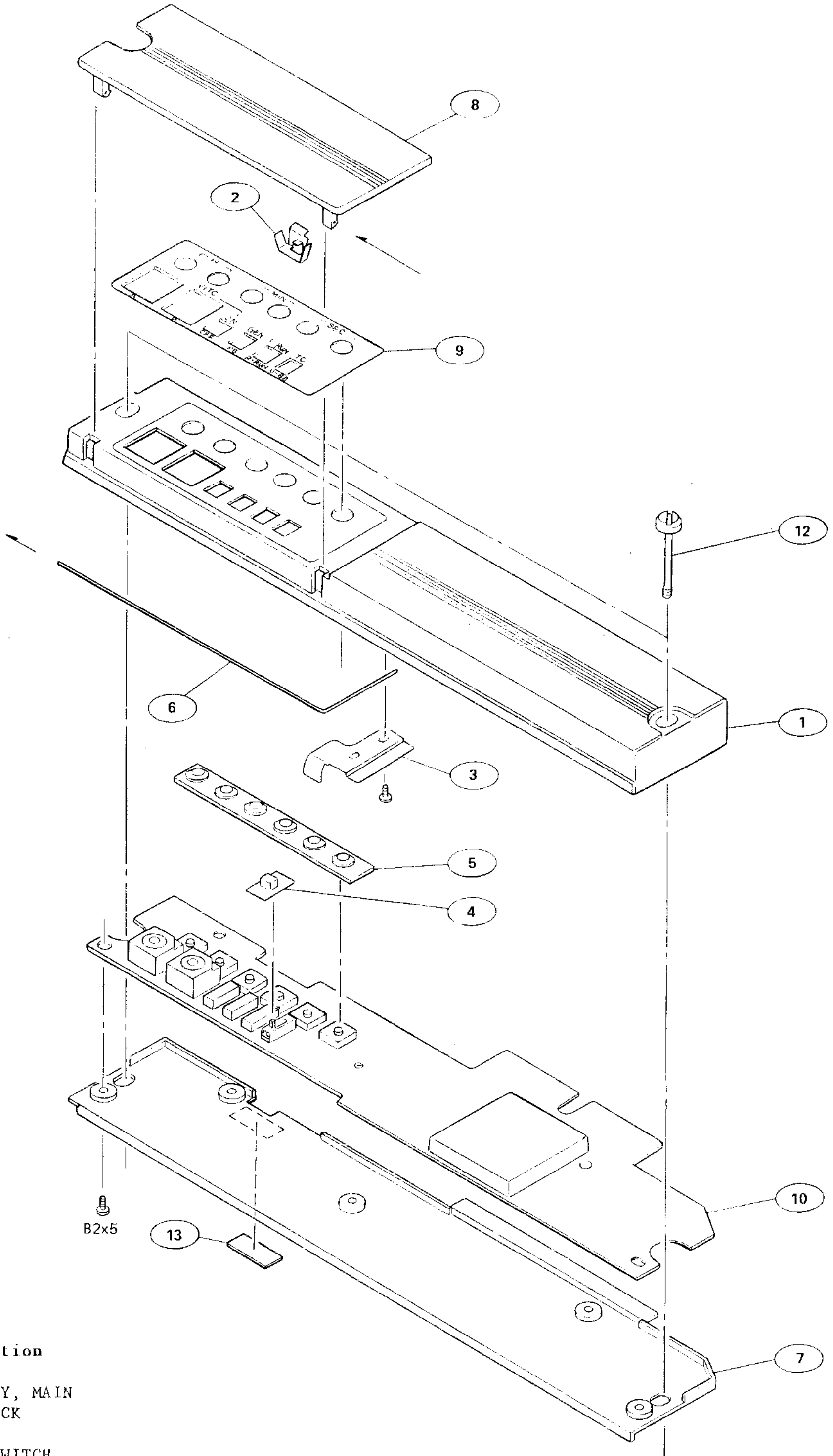
2. The parts marked with "s" in the SP column of the exploded views and electrical spare parts list are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

SECTION 4
SPARE PARTS

4-1. PARTS INFORMATION

The parts marked with "s" in the SP column of the exploded view and electrical spare parts list are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

4-2. EXPLODED VIEW

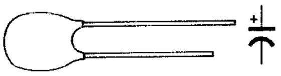


No.	Parts No.	SP	Description
1	X-2295-914-1	o	SUB ASSY, MAIN
2	2-357-040-01	o	ARM, LOCK
3	2-357-041-01	o	HOLDER
4	2-357-042-01	s	KNOB, SWITCH
5	2-357-043-01	s	SHEET, BUTTON
6	2-357-044-01	o	SHAFT, HINGE
7	2-357-045-02	o	LID, REAR
8	2-357-046-01	o	LID
9	2-357-047-01	o	PANEL, CONTROL
10	1-616-279-11	o	PRINTED CIRCUIT BOARD, TC-30
11	3-650-537-00	o	WASHER
12	3-676-089-43	s	SCREW, LID (4x24)
13	2-357-075-01	o	LABEL (DROP FRAME) (J : S/N 10001 AND HIGHER) (UC: S/N 10001 AND HIGHER)

4-3. ELECTRICAL PARTS LIST

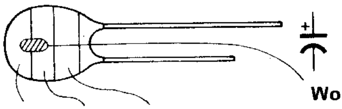
Parts that are not listed in the "reference numbers order list" are shown in following table. Reference numbers are omitted.

TANTALUM CAPACITOR



0.01μF through 100μF ± 10%
3.15V through 35V

NOTE: **The value of the parts that are marked by * in the below table are indicated by color code. (to the value with ± 20%)**



Working Voltage Color Code

Ex. **BRN GRN BLU**
1 5 6
15 x 10^6 pF = 15μF

BLK	RED	YEL	GRN	BLU	GRY	WHT
10V	35	6.3	16	20	25	3.15

Parts No. 1-131-□□□-00

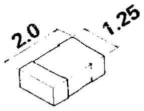
Value		Parts No. —□□□—
0.01μ	35V	*396
0.015	35	*397
0.022	35	*398
0.033	35	*399
0.047	35	*400
0.068	35	*401
0.1	35	341
0.15	35	342
0.22	35	343
0.33	25	*409
	35	344
0.47	20	*412
	35	345
0.68	16	*415
	25	*410
	35	346
1.0	10	*418
	25	498

Value		Parts No. —□□□—
1.0μ	35V	347
1.5	6.3	*421
	20	499
	25	354
	35	348
2.2	3.15	*424
	16	500
	20	361
	25	355
	35	349
3.3	10	501
	16	368
	20	362
	25	356
	35	350
4.7	6.3	502
	10	375
	16	369

Value		Parts No. —□□□—
4.7μ	20V	363
	25	357
	35	351
6.8	3.15	503
	6.3	382
	10	376
	16	370
	20	364
	25	358
	35	352
10	3.15	389
	6.3	383
	10	377
	16	371
	20	365
	25	359
	35	353
15	3.15	390
	6.3	384

Value		Parts No. —□□□—
15μ	10V	378
	16	372
	20	366
	25	360
22	3.15	391
	6.3	385
	10	379
	16	373
	20	367
33	3.15	392
	6.3	386
	10	380
	16	374
47	3.15	393
	6.3	387
	10	381
68	3.15	394
	6.3	388
100	3.15	395

CHIP CERAMIC CAPACITOR



220pF through $0.018\mu F$(B) ± 10% 50WV

$0.022\mu F$ through $0.068\mu F$(F) $^{+80}_{-20}$ % 50WV

$0.1\mu F$(F) $^{+80}_{-20}$ % 25WV

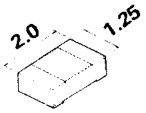
Parts No. 1-163-□□□-00

Value	Parts No. — □□□ —
100pF	—
120	—
150	—
180	—
220	001
270	002
330	003
390	004
470	005
560	006
680	007
820	008

Value	Parts No. — □□□ —
$0.001\mu F$	009
0.0012	010
0.0015	011
0.0018	012
0.0022	013
0.0027	014
0.0033	015
0.0039	016
0.0047	017
0.0056	018
0.0068	019
0.0082	020

Value	Parts No. — □□□ —
$0.01\mu F$	021
0.012	022
0.015	023
0.018	024
0.022	033
0.027	—
0.033	034
0.039	—
0.047	035
0.056	—
0.068	036
0.082	—
0.1	038

CHIP RESISTOR



±5% 1/10W
0Ω through 3.3MΩ

Parts No. 1-216-□□□-00

Value	Parts No. — □□□ —
0Ω	295
1Ω	—
1.1	—
1.2	—
1.3	—
1.5	—
1.6	—
1.8	—
2	—
2.2	298
2.4	301
2.7	302
3	303
3.3	304
3.6	305
3.9	306
4.3	307
4.7	308
5.1	297
5.6	309
6.2	310
6.8	311
7.5	312
8.2	313
9.1	314
10Ω	001
11	002
12	003
13	004
15	005
16	006
18	007
20	008
22	009
24	010
27	011

Value	Parts No. — □□□ —
30	012
33Ω	013
36	014
39	015
43	016
47	017
51	018
56	019
62	020
68	021
75	022
82	023
91	024
100Ω	025
110	026
120	027
130	028
150	029
160	030
180	031
200	032
220	033
240	034
270	035
300	036
330	037
360	038
390	039
430	040
470	041
510	042
560	043
620	044
680	045
750	046
820	047

Value	Parts No. — □□□ —
910	048
1kΩ	049
1.1	050
1.2	051
1.3	052
1.5	053
1.6	054
1.8	055
2	056
2.2	057
2.4	058
2.7	059
3	060
3.3	061
3.6	062
3.9	063
4.3	064
4.7	065
5.1	066
5.6	067
6.2	068
6.8	069
7.5	070
8.2	071
9.1	072
10kΩ	073
11	074
12	075
13	076
15	077
16	078
18	079
20	080
22	081
24	082
27	083

Value	Parts No. — □□□ —
30	084
33kΩ	085
36	086
39	087
43	088
47	089
51	090
56	091
62	092
68	093
75	094
82	095
91	096
100kΩ	097
110	098
120	099
130	100
150	101
160	102
180	103
200	104
220	105
240kΩ	106
270	107
300	108
330	109
360	110
390	111
430	112
470	113
510	114
560	115
620	116
680	117
750	118
820	119

Value	Parts No. — □□□ —
910	120
1MΩ	121
1.1	122
1.2	123
1.3	124
1.5	125
1.6	126
1.8	127
2	128
2.2	129
2.4	130
2.7	131
3	132
3.3	133

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
C□□	CAPACITOR	L□□	INDUCTOR	X□□	CRYSTAL
D□□	DIODE	Q□□	TRANSISTOR		
IC□□	IC	S□□	SWITCH		

All capacitors are in micro farads unless otherwise specified.

All inductors are in micro henries unless otherwise specified.

Ref.No.	Parts No.	SP	Description
TC-30 BOARD			
	1-616-279-11	o	PRINTED CIRCUIT BOARD,TC-30
C1	1-163-243-00	s	CERAMIC CHIP 47PF 5% 50V
C2	1-163-243-00	s	CERAMIC CHIP 47PF 5% 50V
C8	1-163-141-00	s	CERAMIC CHIP 0.001 5% 50V
C9	1-163-141-00	s	CERAMIC CHIP 0.001 5% 50V
C10	1-163-235-00	s	CERAMIC CHIP 22PF 5% 50V
C14	1-124-225-00	s	ELECT 100 20% 6.3V
C21	1-131-349-00	s	TANTALUM 2.2 10% 35V
C22	1-131-349-00	s	TANTALUM 2.2 10% 35V
C23	1-161-463-00	s	CERAMICM 2200PF 5% 50V
D1	8-719-101-23	s	1SS123
D2	8-719-100-05	s	1S2837
D3	8-719-100-05	s	1S2837
D4	8-719-100-05	s	1S2837
D5	8-719-100-05	s	1S2837
D6	8-719-100-03	s	1S2835
D8	8-719-100-05	s	1S2837
D9	8-719-100-05	s	1S2837
D10	8-719-101-23	s	1SS123
IC1	8-759-909-16	s	CX7907A(SONY)
IC2	8-759-912-92	s	CX23051(SONY)
IC3	8-759-200-88	s	TC4512BF(TOSHIBA)
IC4	8-759-906-43	s	SM6430C(NPC)
IC5	8-759-201-80	s	TC4526BF(TOSHIBA)
IC6	8-759-040-46	s	MC14046BCP(HITACHI)
IC7	8-759-200-90	s	TC4538BF(TOSHIBA)
IC8	8-759-906-53	s	TL062CPS(TI)
IC9	8-759-200-83	s	TC4071BF(TOSHIBA)
IC10	8-759-201-61	s	TC40H004F(TOSHIBA)
IC11	8-759-200-88	s	TC4512BF(TOSHIBA)
IC12	8-759-200-88	s	TC4512BF(TOSHIBA)
L1	1-408-982-21	s	100uH

Ref.No.	Parts No.	SP	Description
Q1	8-729-901-01	s	DTC144EK
Q2	8-729-901-01	s	DTC144EK
Q3	8-729-901-01	s	DTC144EK
Q4	8-729-100-76	s	2SA812
Q5	8-729-122-63	s	2SA1226
S1	1-553-977-00	s	SLIDE "VITC ON/OFF"
S2	1-553-977-00	s	SLIDE "TIME CODE/USERS-BIT"
S3	1-553-977-00	s	SLIDE "FREE RUN/REC RUN"
S4	1-553-977-00	s	SLIDE "GEN/PB REC RUN"
S5	1-570-337-11	s	ROTARY (SEXADECIMAL) "VITC POSITION SELECT-A"
S6	1-570-337-11	s	ROTARY (SEXADECIMAL) "VITC POSITION SELECT-B"
S7	1-554-371-00	s	TACT "DATA PRESET"
S8	1-554-371-00	s	TACT "DATA PRESET"
S9	1-554-371-00	s	TACT "DATA PRESET"
S10	1-554-371-00	s	TACT "DATA PRESET"
S11	1-554-371-00	s	TACT "DATA PRESET"
S12	1-554-371-00	s	TACT "DATA PRESET"
*S13	1-554-682-00 (S/N:10023 and higher-EK) (S/N:10001 and higher-UC, J)	s	SLIDE
X1	1-527-853-00	s	OSC. 7159.075KHz
X2	1-567-079-00	s	OSC. 31.4685KHz

BKU-150 (UC, J)
BKU-150P (EK)
2-357-034-02

Sony Corporation
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Printed in Japan
1985. 8 11

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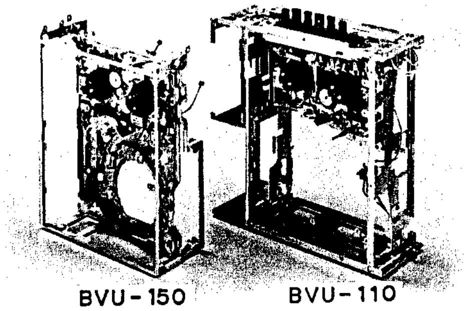
Section 9. Measuring Equipment, Jigs, and Tools
Section10. Alignment Procedure

SECTION 1
GENERAL DESCRIPTION

1-1. Improved Video and Audio Performance
1-2. Lightweight and Compact
1-3. Simultaneous Playback and Recording
1-4. Remaining Tape Displayed
1-5. Quick, Stable Assemble Editing because of PB Servo System
1-6. Feather-Touch Keys
1-7. Self-Diagnostic Function

The BVU-150P is a portable Superior Performance(SP) U-matic videocassette recorder that is lightweight, compact, easy to operate, and offers much improved video and audio performance. It has the following features.



1-1. Improved Video and Audio Performance

The video picture quality has been improved by the adoption of Superior Performance(SP) circuit and the inclusion of advanced technology into the conventional circuit.

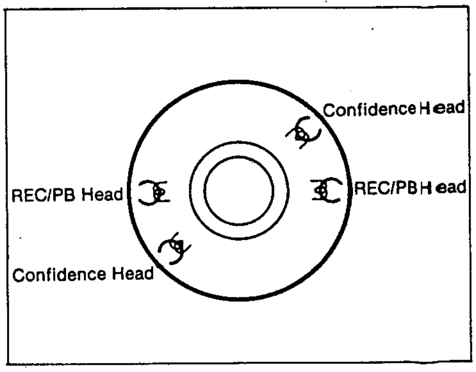
In the audio system, the audio S/N quality and the audio frequency response have been improved by employing the c type Dolby Noise Reduction System and newly designed audio head.

1-2. Lightweight and Compact

The BVU-150P is lightweight and compact because of its cast aluminum chassis, flat direct-drive capstan, flat mechanism and flat drum. It has 73% of the capacity and 74% of the weight of the BVU-110P.

1-3. Simultaneous Playback and Recording

In addition to the record/playback heads, the BVU-150P has two confidence heads, which enables it to playback recorded signals in real time.



1-4. Remaining Tape Displayed

The amount of tape left is displayed in characters on the viewfinder's screen. When a camera's return video switch is pressed, the characters mixed with the confidence picture will be displayed. The table shows the relationship between the displayed characters and the tape amount.

1-5. Quick, Stable Assemble Editing because of PB Servo System

In a conventional VTR, backspace editing must be done by shifting the preceding guide. However, the BVU-150P employs a high speed servo system which is exclusively for backspace editing.

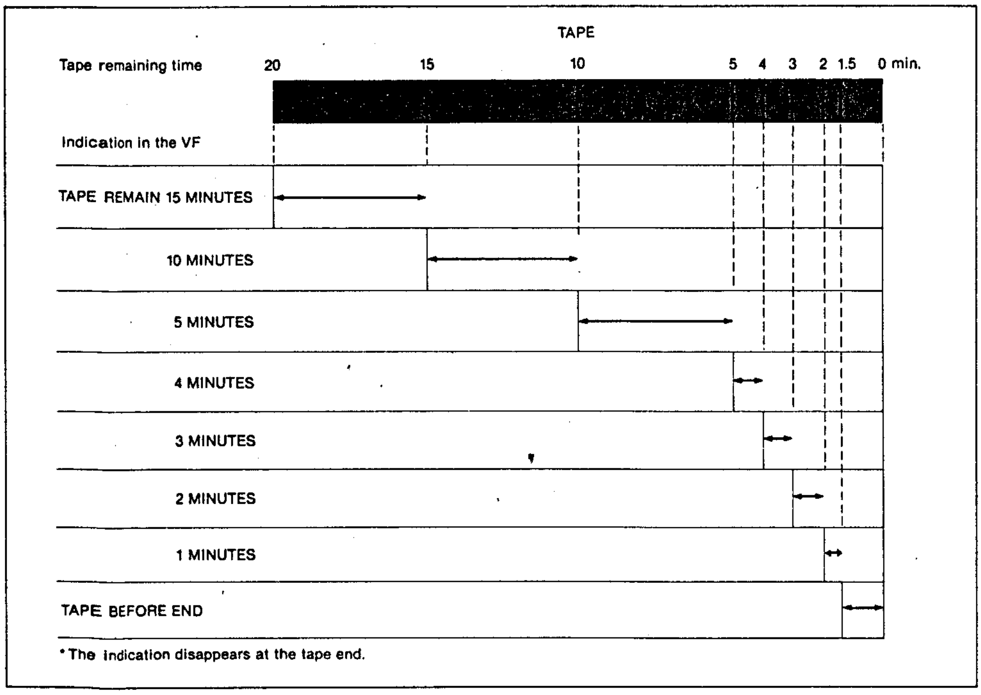
1-6. Feather-Touch Keys

All the keys, except for the EJECT key, have a feather touch. Just punch the desired mode button and the current mode can be transferred directly to the desired mode. The eject function is done mechanically.

When the BVU-150P is in the video recording mode, only the STOP and EJECT keys of the BVU-150P activate. And the key inhitit switch on the front panel deactivates all the buttons (except the EJECT button) of the BVU-150P. They protect against accidential operation.

1-7 Self-Diagnostic Function

This function is possible because of the built-in microcomputer. The self-diagnostic function is displayed on the LCD counter.



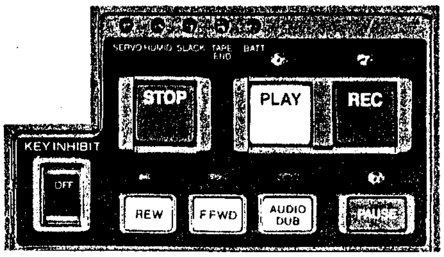
*The indication disappears at the tape end.

1-8 TC [illegible]
VITC and
[illegible]

1-9 TBC connection
capability

1-10 with BP90 & BVU150 BVP-3 [illegible]
1 hour
BVU150 stand alone
2 hours

1-11 Remote control
RM-680

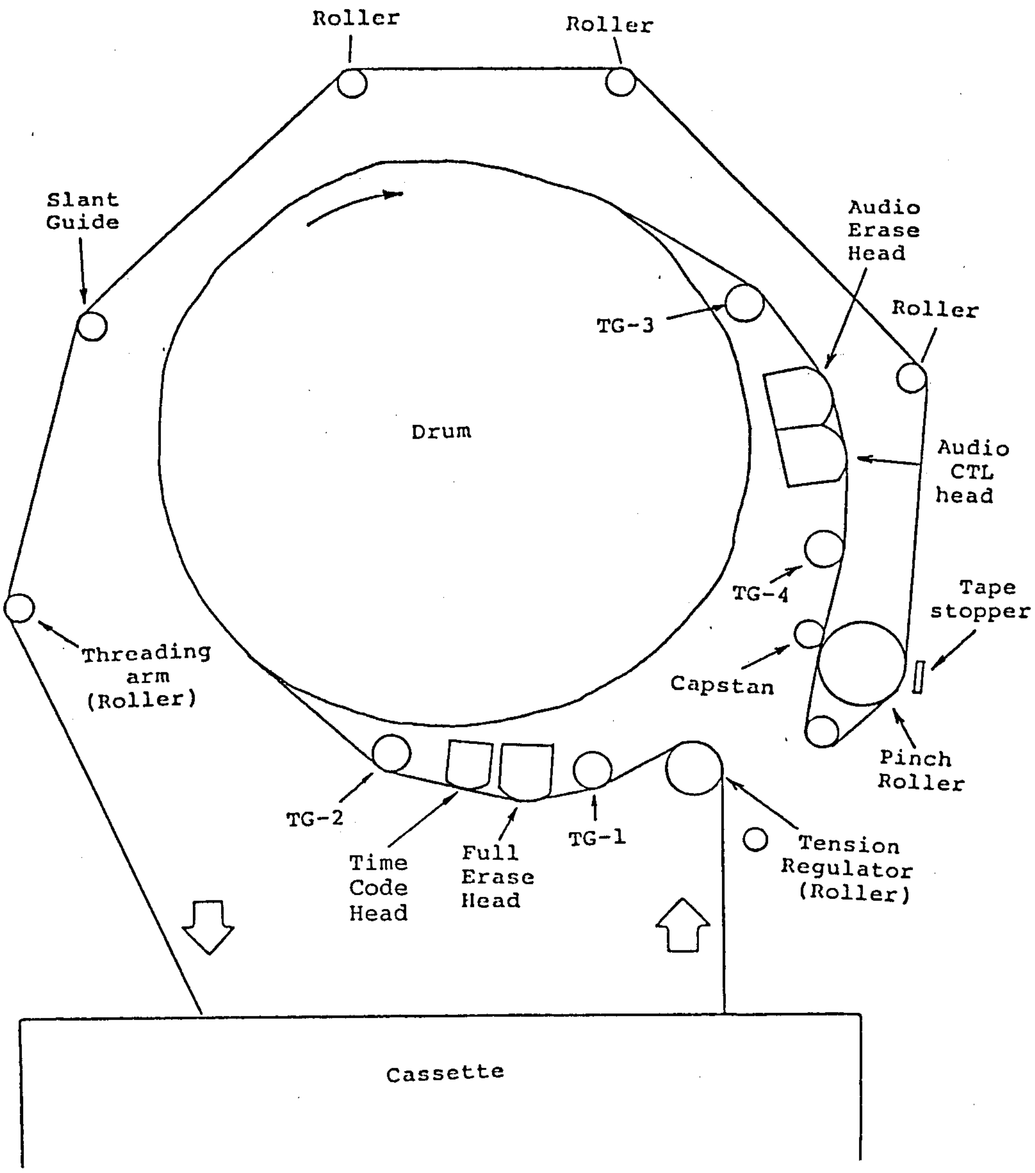


SECTION 2
MECHANISM

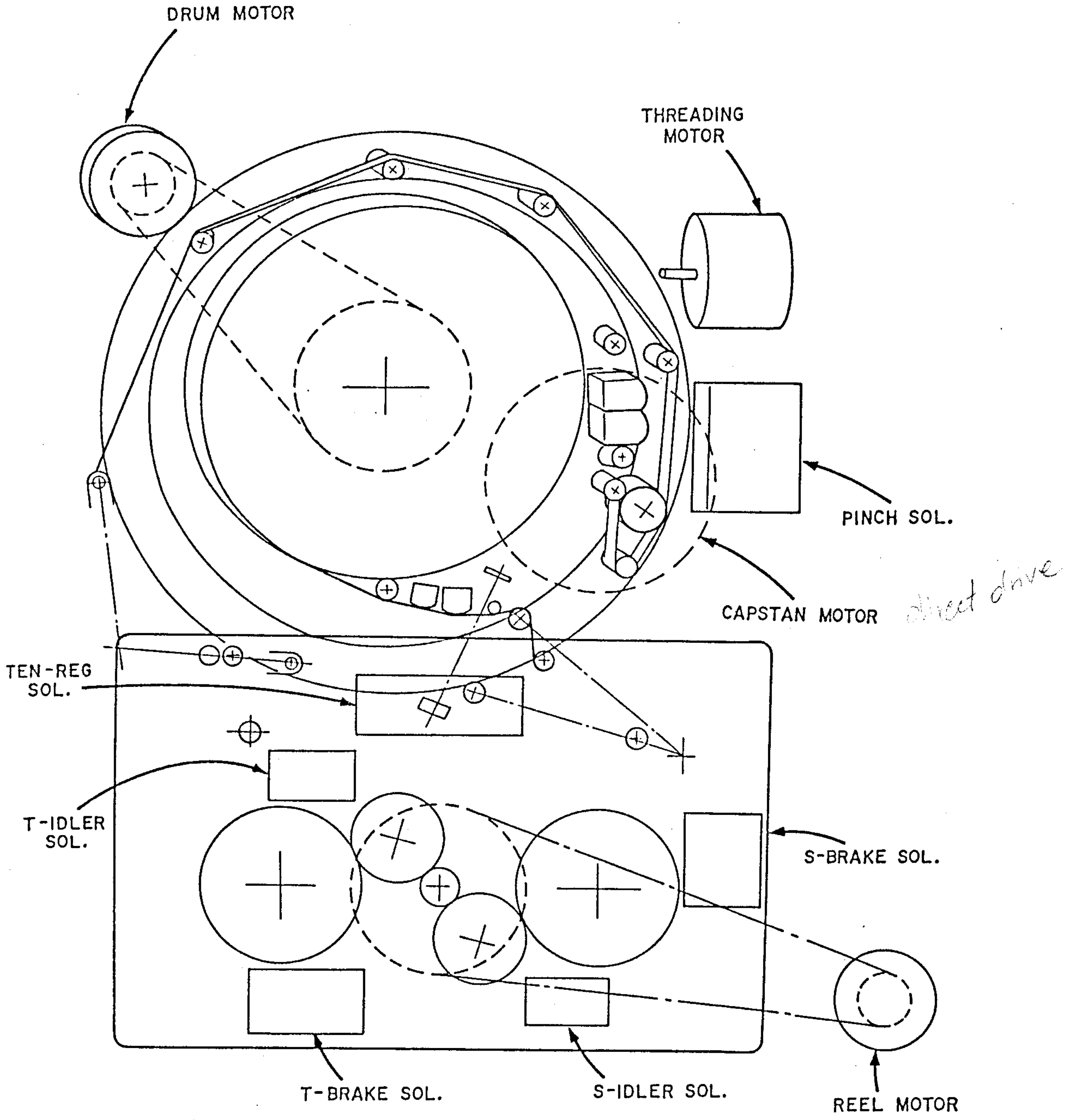
2-1. Tape Transport
2-2. Location of Motors and Plungers
2-3. Tension Regulator
2-4. Capstan
2-5. Threading Ring
2-6. Tape Drive Mechanism
2-7. Idler
2-8. Head Drum
2-9. Cassette Compartment
2-10. Audio/CTL Head and Audio Erase Head

2-1. Tape Transport

The tape transport is as shown.



2-2. The Motors and Plungers are Located as Shown



μ switch used
eject
C - [illegible]
C - [illegible]
Thread - [illegible]
un-Thr. - End
miss - rec
[illegible] - [illegible]

The ON(engage) or OFF(disengage) status of plungers is as following.

([illegible] the type of sol.)
plunger
2 plunger at one time active,
control [illegible]

Pinch SOL.
- engage --- Pinch roller is pressed against the capstan and S-soft brake is released.
- disengage --- Pinch roller is released from the capstan and S-soft brake is applied.

S-brake SOL.
- engage --- S-main brake is released.
- disengage --- S-main brake is applied.

T-brake SOL.
- engage --- T-main brake is released.
- disengage --- T-main brake is applied.

S-idler SOL.
- engage --- S-idler turns on and S-soft brake is released.
- disengage --- S-idler turns off and S-soft brake is applied.

T-idler SOL.
- engage --- T-idler turns on and T-soft brake is released.
- disengage --- T-idler turns off and T-soft brake is applied.

TEN-REG SOL.
- engage --- TEN-REG band brake is applied. (Tape stopper turns off.)
- disengage --- TEN-REG band brake is released. (Tape stopper turns on.)

The plungers and motors are in the following status in each modes.

MECHANISM	MODE	Threading	Un-threading	STOP	FWD	FF	REW	PAUSE
SOLENOID	Pinch SOL.	OFF	OFF	OFF	ON	OFF	OFF	OFF
	S-brake SOL.	ON	ON (OFF)	OFF	ON	ON	ON	OFF
	T-brake SOL.	OFF	OFF (ON)	OFF	ON	ON	ON	OFF
	S-idler SOL.	OFF	ON (OFF)	OFF	OFF	OFF	ON	OFF
	T-idler SOL.	OFF	OFF (ON)	OFF	ON	ON	OFF	OFF
	TEN-REG SOL.	ON	OFF	OFF	ON	OFF	OFF	ON
MOTOR	Drum motor	ON	ON	OFF	ON	ON	ON	ON
	Capstan motor	ON	OFF	OFF	ON	OFF	OFF	ON
	Reel motor	OFF	ON	OFF	ON	ON	ON	OFF
	Threading motor	ON	ON	OFF	OFF	OFF	OFF	OFF

Note : ( ) = T-side unthreading

2-3. Tension Regulator

A ball bearing built into the tension regulator ensures stable, smooth tape travelling. The tension regulator adjusts 90% of the tape path at the drum entrance. The tape supplied from the S-reel is slightly lifted upwards by the tension regulator, and lowered by the tape guide TG-1 and TG-2, then transported to the drum entrance.

2-4. Capstan

The mechanism includes a newly designed flat direct-drive capstan motor.

The size has been reduced compared with the capstan motor used in the BVU-110P while at the same time efficiency and stability are improved.

2-5. Threading Ring

A 4mm thick, plastic-coated steel ring is used.

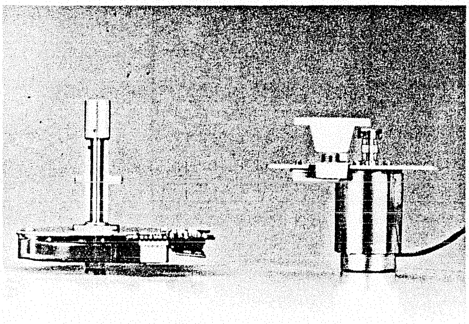
2-6. Tape Drive Mechanism

The chassis is made of cast aluminum. The drive mechanism uses keep-solenoid (self-magnet type) plungers instead of links for a simpler structure.

Attraction: ALNICO is magnetized; the plunger engages
Repulsion: ALNICO is de-magnetized; the plunger disengages

2-7. Idler

Urethane rubber is used for the idlers to save wear.



BVU-150 BVU-110

2-8. Head Drum

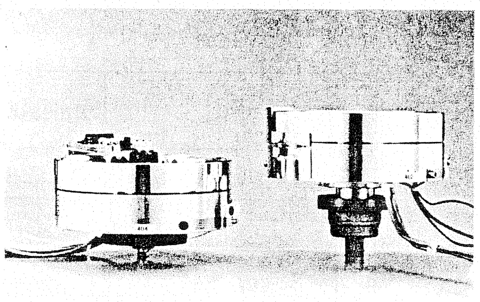
The newly designed upper drum and lower drum are thin and light. The drums' ball bearings are housed in the rotary transformer. The CONFI head is installed so that the pre-amplifier for the CONFI head PA-45 board is mounted on the drum and the brush is installed for its power supply.

2-9. Cassette Compartment

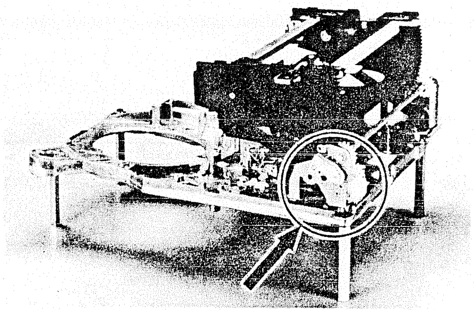
The newly designed cassette compartment is 20% lighter than the conventional.

In order to take a cassette in and out without using battery power, the cassette compartment functions mechanically. Tape ejection is gentle because of the damper. When installing the cassette compartment, no adjustment is required since it is installed directly to the chassis.

The edge of the cassette compartment lid is shielded with rubber to keep out rain and dust.

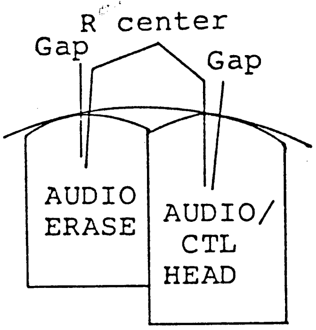


BVU-150 BVU-110

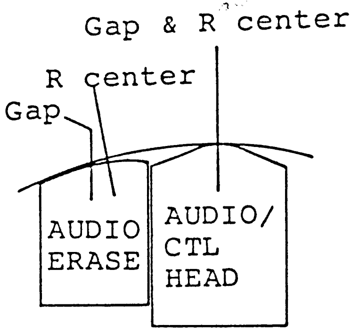


2-10. Audio/CTL Head and Audio Erase Head

The audio/CTL head and audio erase head of the BVU-150P are newly designed. The gap of the conventional audio head is shifted 0.7mm from its radial center. However, the gap of the BVU-150P's audio head is located directly in the center to improve the contact with the tape and the audio frequency response.



BVU-110
(Permaloy)



BVU-150
(Sendust)

SECTION 3

POWER SUPPLY CIRCUIT

3-1. Power Input < 7 Amps peak (normally 4.4A)
3-2. Power Switch and Fuse
3-3. REG 10.5V Circuit
3-4. PB 10.5V Circuit
3-5. DC-DC Converter
3-6. EVER 5V
3-7. CAMERA 12V and Battery Meter Circuit
3-8. Protection Against Short-Circuits
3-9. POWER OFF Circuit

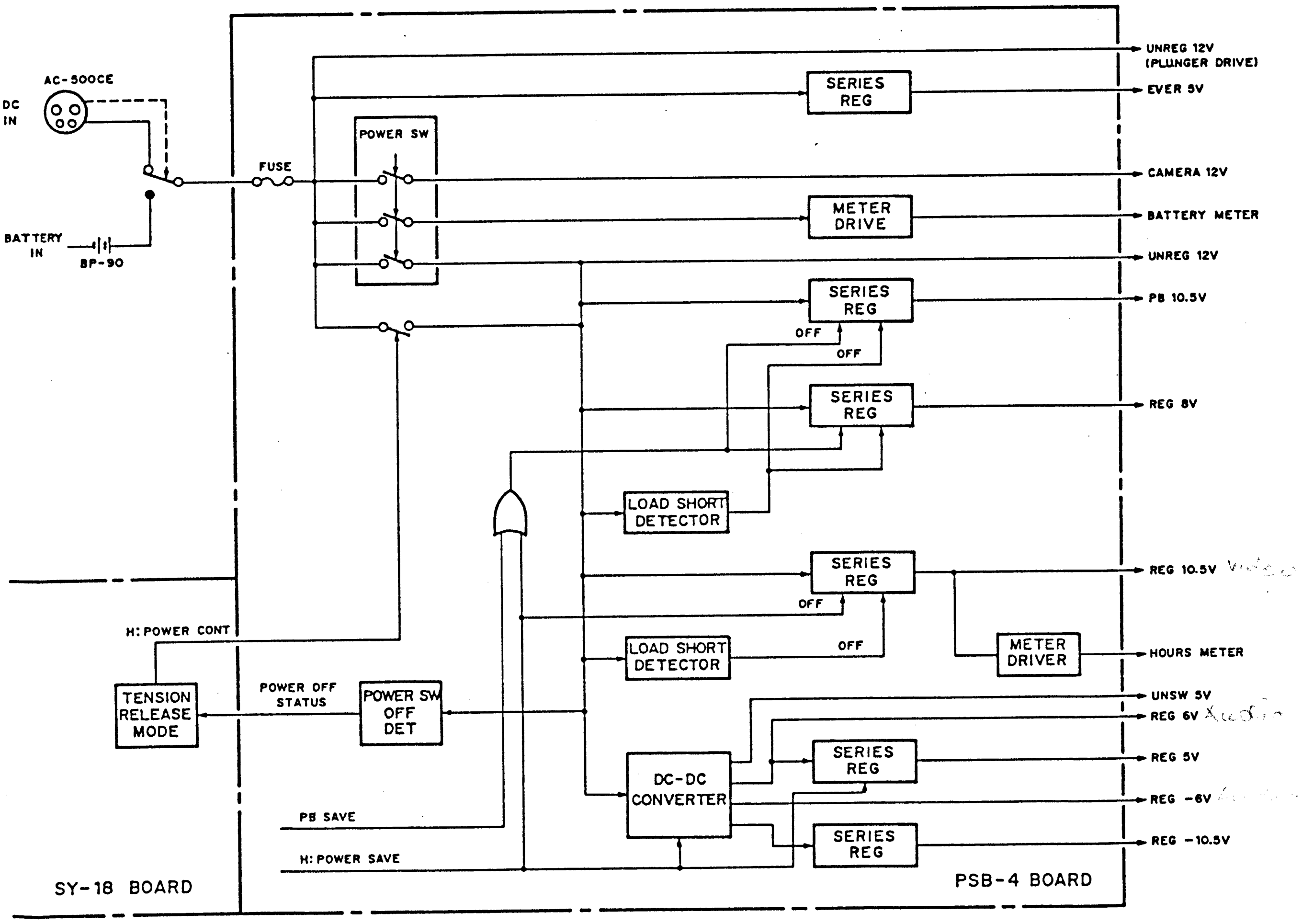


Fig.3-1: block diagram of the power supply circuit

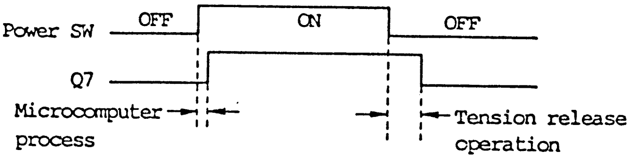
3-1. Power Input

The BVU-150P uses either battery (BP-90) or external dc power (AC-500CE) as a power source. External dc power is supplied through the four-pin XLR connector. The microswitch built into the XLR connector is normally set to the battery mode, and is switched to DC 12V IN when the XLR connector is connected.

3-2. Power Switch and Fuse

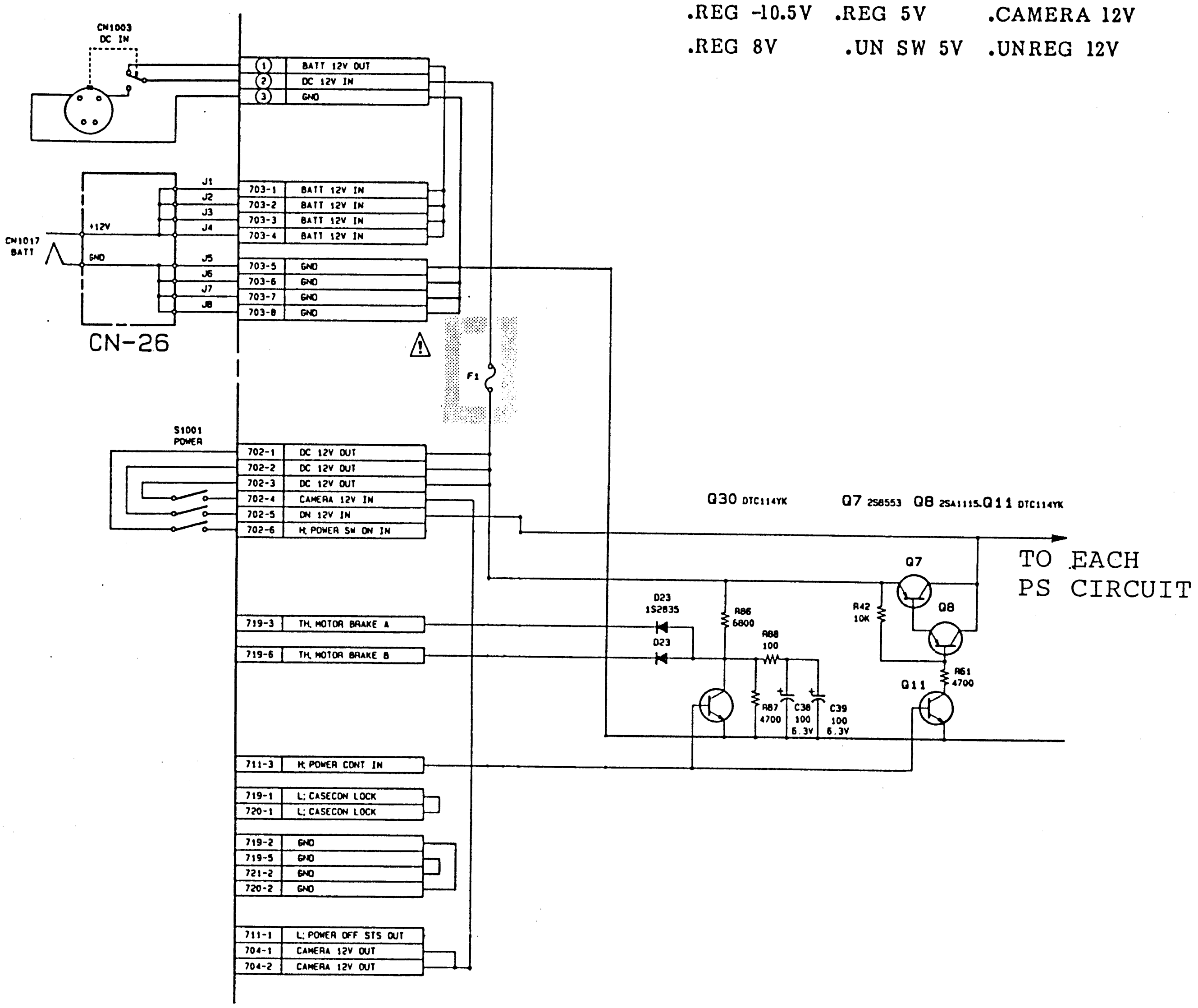
The battery dc or the external dc is supplied to the power source of the UNREG 12V, EVER 6V and EVER 5V in the PSB-4 board, and to the power switch via the fuse F1. When the power switch is turned on, +12V is applied to CN 702-4, 5 and 6.

Normally +12V is supplied to each power circuit in the PSB-4 board via CN 702-5 (ON 12V IN). In order to prevent a voltage drop of +12V when the power switch is turned off, Q7 is turned on as shown in the figure.



The PSB-4 board supplies power to the following.

- .REG 10.5V
- .PB 10.5V
- .REG -10.5V
- .REG 8V
- .REG 6V
- .REG -6V
- .REG 5V
- .UN SW 5V
- .EVER 5V
- .EVER 6V
- .CAMERA 12V
- .UNREG 12V



3-3. REG 10.5V Circuit

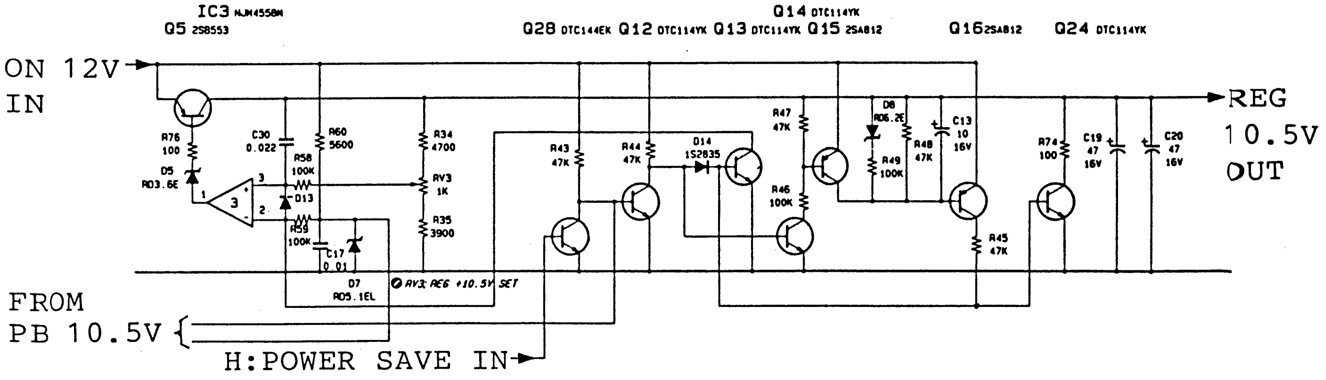
The REG 10.5V circuit consists of IC3(1/2), Q5, D5, D7 and D13. When a reference voltage is applied to pin 2 of IC3(1/2), the 10.5V regulator Q5 connected to pin 1 of IC3(1/2) turns on, and REG 10.5V is output. R34, RV3 and R35 produce a comparison voltage which is fed back to pin 3 of IC3(1/2).

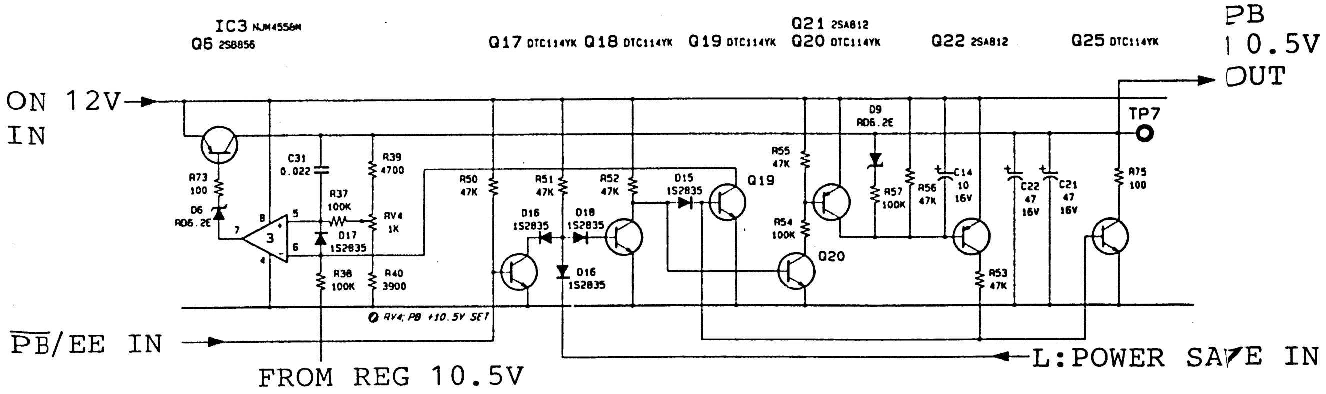
IC3(1/2) compares the line output voltage with the reference voltage and controls the resistance across the emitter and collector of Q5. Eventually REG 10.5V is kept constant by the series regulator. In the POWER SAVE mode, the SY-18C board sends an H:POWER SAVE signal to pin 2 of CN 711 on the PSB-4 board.

When the H:POWER SAVE signal is input, Q12 turns off; Q13 turns on; and the reference voltage at pin 2 of IC3(1/2) becomes 0V. With the 0V reference voltage, the output at pin 1 of IC3(1/2) goes approximately to 12V; Q5 turns off; and the REG 10.5V is cut off.

3-4. PB 10.5V Circuit

The PB 10.5V circuit consists of IC3(2/2), Q6, D6 and D17. In the same manner used in the REG 10.5V circuit, IC3(2/2) compares the line output voltage with the reference voltage and controls Q6 so that the output of the PB 10.5V regulator Q6 is kept constant. The PB 10.5V circuit is controlled by the POWER SAVE signal (CN 711-2) from the SY-18C board and the PB/EE (CN 713-1) signal from the SY-22A board. When the H:POWER SAVE signal is input, the cathode of D16 goes low, and Q18 turns off. As Q19 turns on, pin 6 of IC3 (2/3) becomes 0V; Q6 turns off; and the PB 10.5V is cut off. When the PB/EE signal goes high, Q17 turns on; Q18 turns off; Q19 turns on; pin 6 of IC3(2/2) becomes 0V; and Q6 turns off.





3-5. DC-DC Converter

The DC-DC converter generates the following voltage by inputting the UNREG 12V to pin 7.

pin 2 : REG -12V

pin 5 : REG +6V

pin 3 : REG -6V

pin 6 : UN SW 5V

The REG 6V and REG -6V powers are mainly used in the audio circuit.

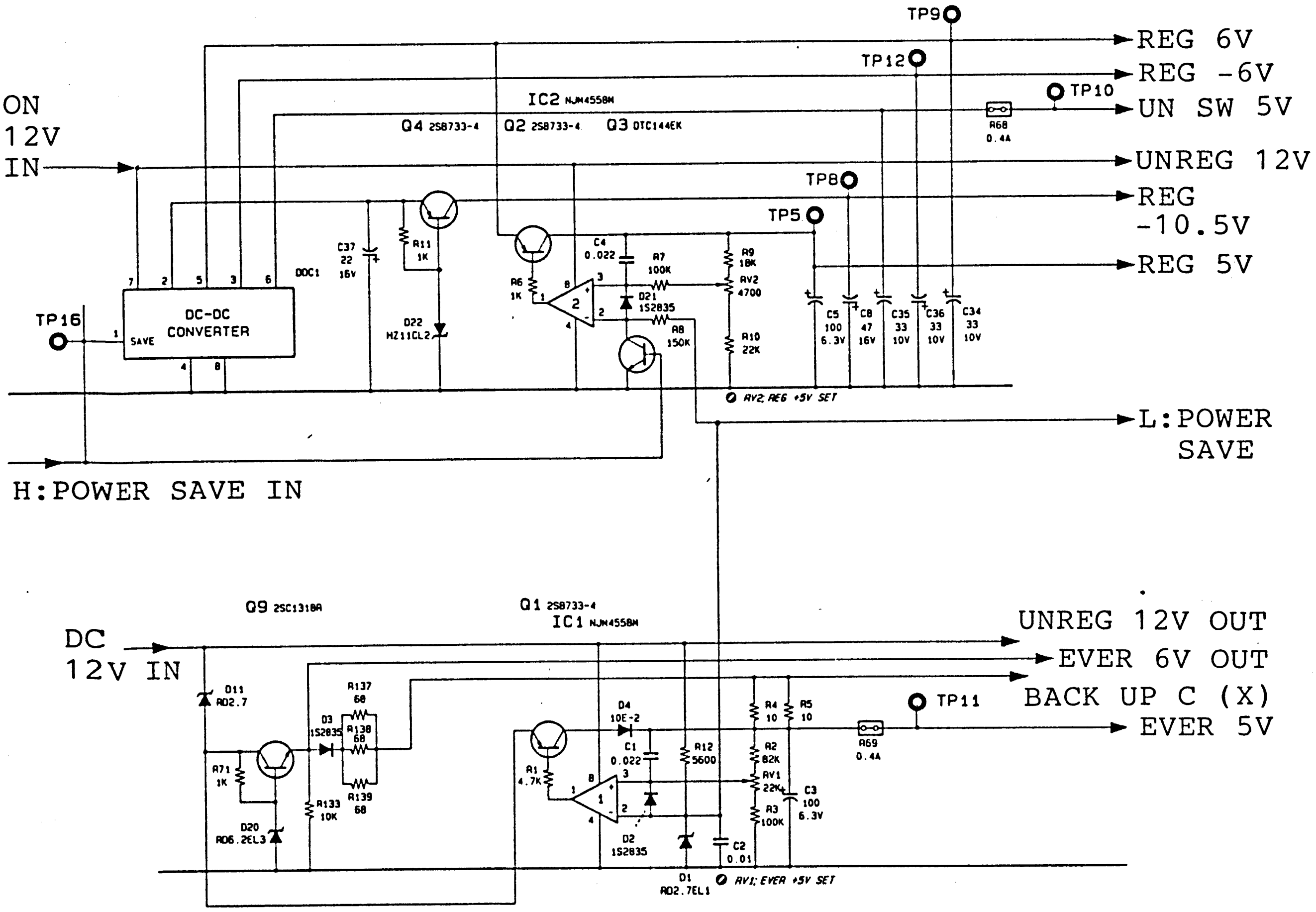
The -10.5V regulator Q4 regulates -12V output of the DC-DC converter, and send it to each circuit.

All the REG outputs are controlled by the POWER SAVE signal, but UN SW 5V is always supplied even if the power switch is turned on. The UN SW 5V is used by the microprocessors on the SY-18 and SY-22 boards.

The output of UN SW 5V has the line IC R68 to cut off the power when its load is shorted.

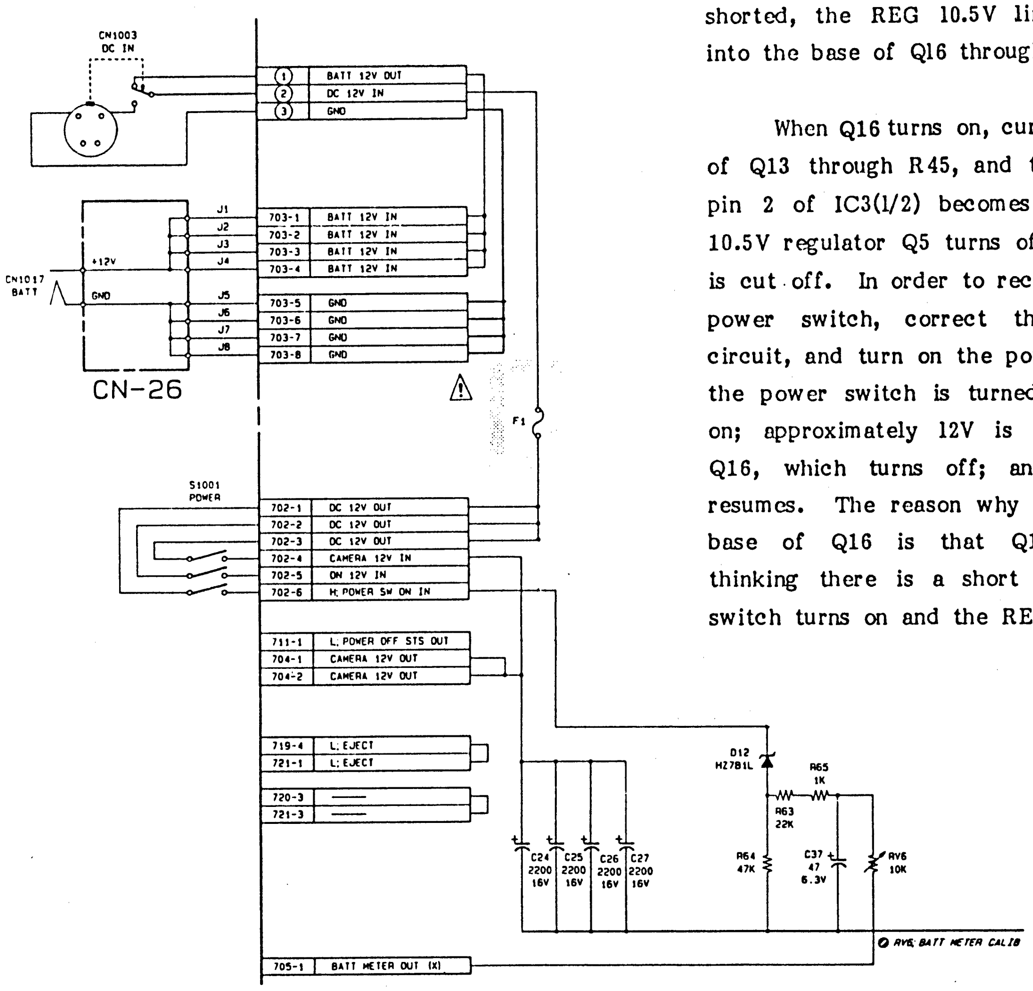
3-6. EVER 5V

The EVER 5V regulator consists of Q1, IC1, D1, D2, and D4. The battery dc or external dc is supplied directly to D11 and Q9 collector via a fuse, without passing through the power switch. In order to keep up the back up time of the microcomputers, the EVER 5V voltage is adjusted to 5.1V.



3-7 CAMERA 12V and Battery Meter Circuit

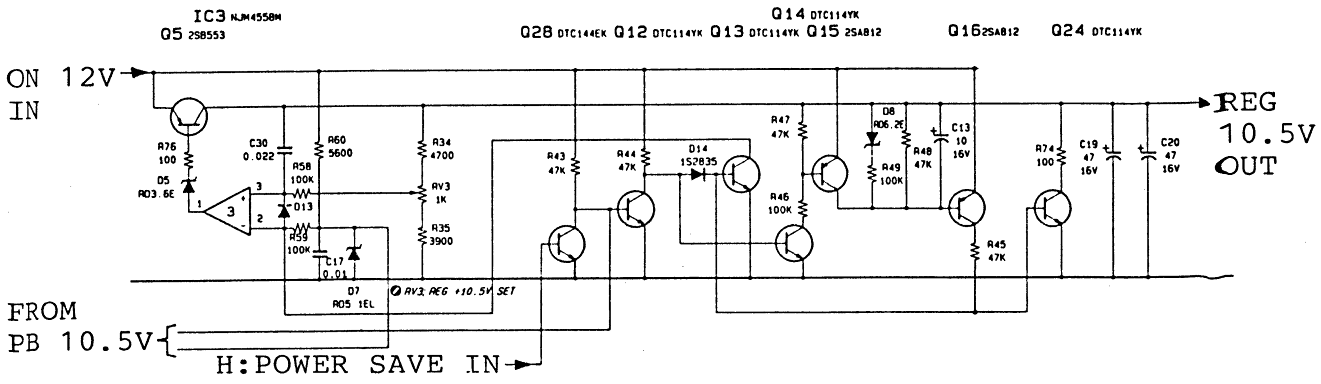
Camera power is supplied directly from the battery or the external dc supplier via the power switch. The battery meter circuit consists of D12, RV6,R63, R64 and R65. The meter current is determined by the Zener voltage of the Zener diode D12.



3-8. Protection Against Short Circuits

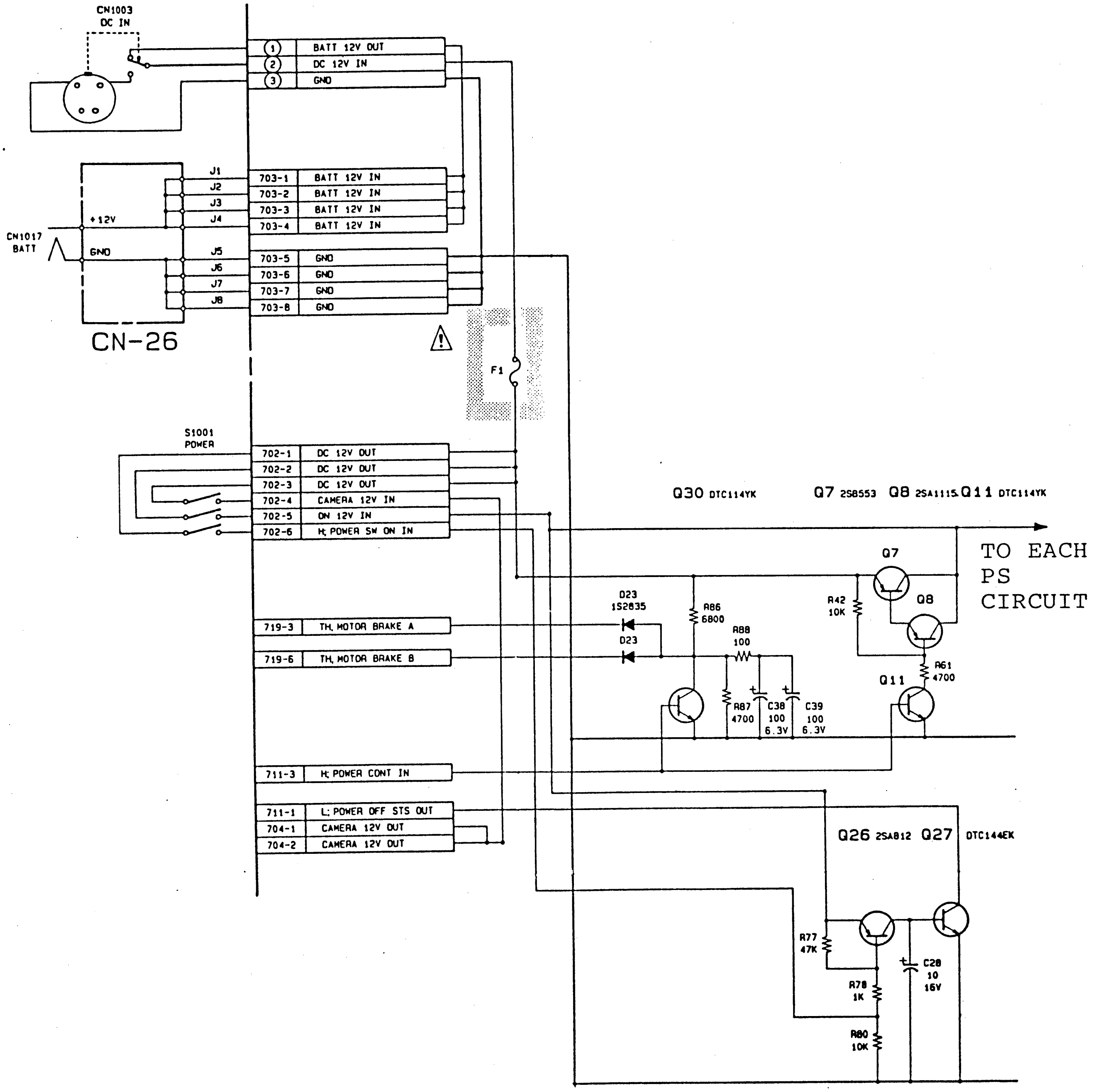
Since the protection circuits of REG 10.5V and PB 10.5V are the same, we will discuss only the protection circuit of REG 10.5V. The protection circuit of REG 10.5V consists of Q14, Q15, Q16, and D8. Normally Q14 and Q15 are on, and Q16 is off. If the output of REG 10.5V is shorted, the REG 10.5V line drops; current flows into the base of Q16 through D8; and Q16 turns on.

When Q16 turns on, current flows into the base of Q13 through R45, and the reference voltage at pin 2 of IC3(1/2) becomes 0V. As a result, the 10.5V regulator Q5 turns off, and the power supply is cut off. In order to recover power, turn off the power switch, correct the cause of the short circuit, and turn on the power switch again. When the power switch is turned on, Q14 and Q15 turn on; approximately 12V is applied to the base of Q16, which turns off; and the normal operation resumes. The reason why C13 is connected to the base of Q16 is that Q16 turns on mistakenly thinking there is a short circuit when the power switch turns on and the REG 10.5V rises.



3-9 POWER OFF Circuit

When the power switch is turned off while the tape has been threaded around the drum, first the tension is released and then all of the power is cut off. When the power switch is turned off, the POWER SW ON signal is opened; Q26 and Q27 are on; and the L:POWER OFF STATUS signal is sent to the SY-18 board. The tension release operation starts upon receipt of this signal in the SY-18 board. After tension is released, the H:POWER CONT signal goes to low and turns off Q11, Q8 and Q7. All the power except for UNREG 12V and EVER 5V are cut off.



3. LUMINANCE PROCESSING

3-1. REC Y Signal (on VO-12 Board)

The Y and chroma signals are separated by the Y/C separator on the YC-20 board after which they are sent to the VO-12 board.

The Y signal from the Y/C separator is sent to connector CN1-3 on the VO-12 board. The main path Y signal is fed to transistor Q123 passing through TP101 and the Y signal in the EE system is buffered using transistors Q122 and Q124, and the Y signal level is controlled by level adjuster RV111. The Y signal is then mixed with the chroma signal. The resulting mixed signal is fed, passing through CN23-4, to the mixing amplifier on the VA-29 board.

Delay time adjustment is not necessary in the EE system.

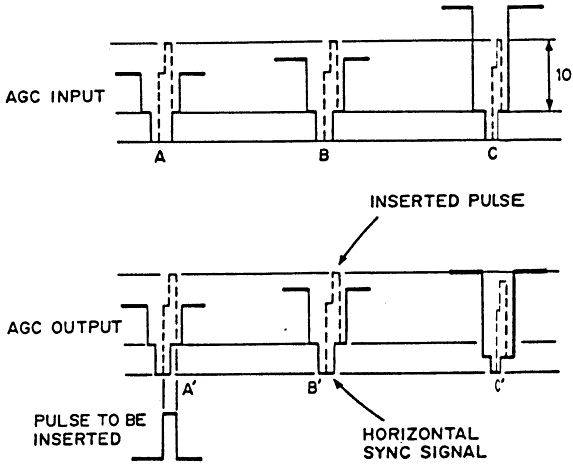
The main Y signal is fed to delay line DL101 through emitter follower Q123. Delay line DL101 has a delay time of 1µs.

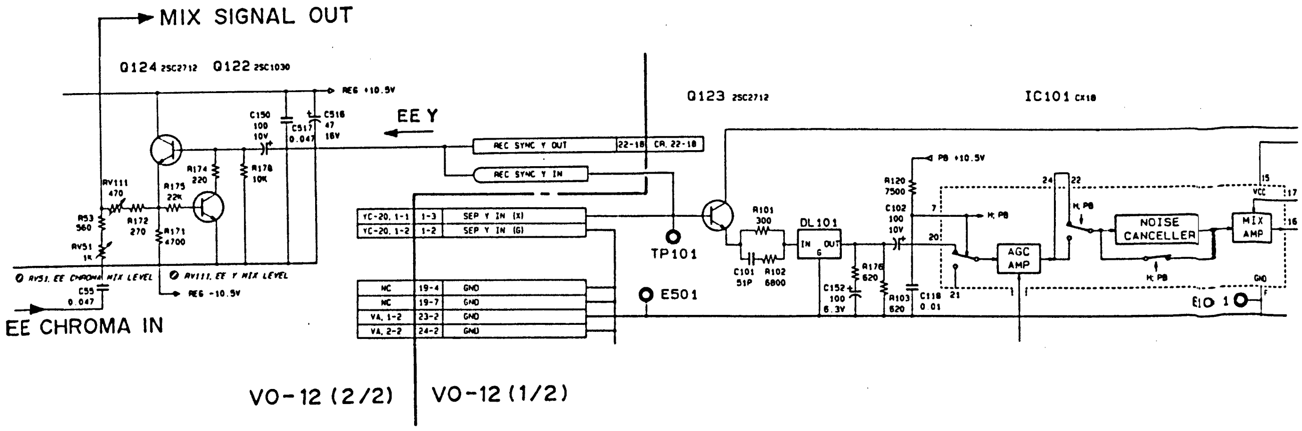
Thereafter, the Y signal is fed to pin 20 of AGC amplifier IC101 (CX-187). The signal level during AGC amplifier input is set at 0.5 Vp-p.

3-2. AGC Amplifier

AGC employs the sync AGC method in IC101 (CX-187), and the sync pulse is added to the pedestal portion of the signal to detect the sync signal level as shown below.

When the added pulse level is greater than the 100% white level, peak AGC functions in place of sync AGC.

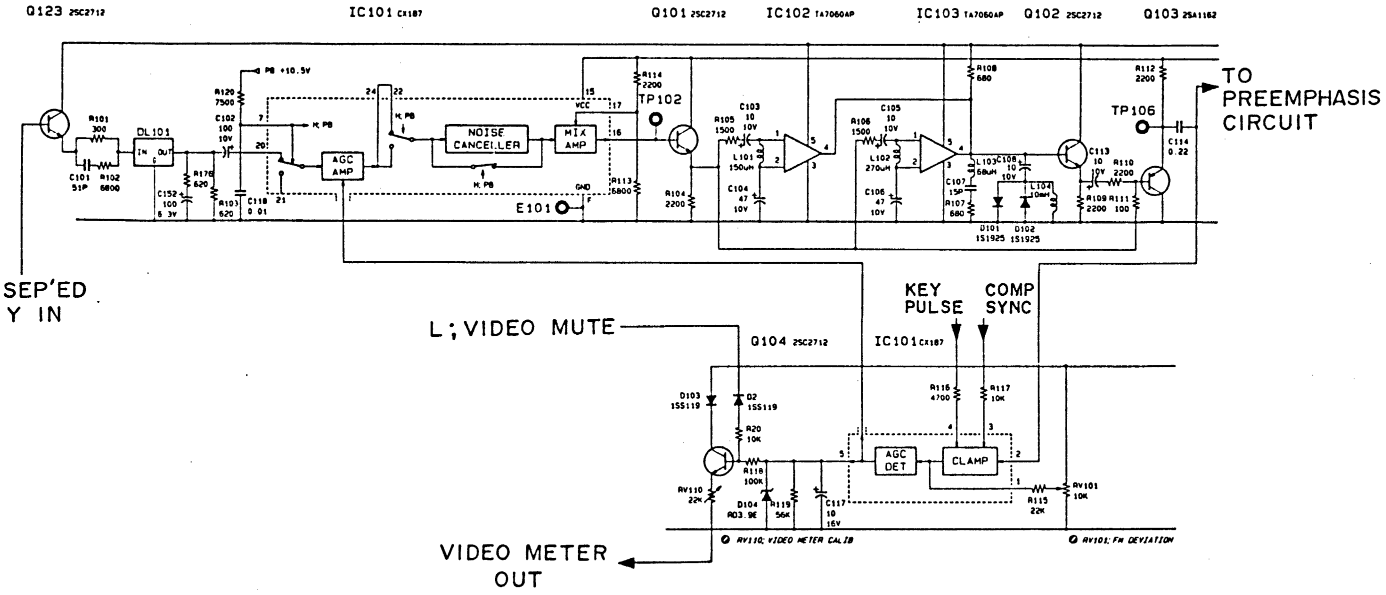




The AGC amplifier output is fed to the high frequency preemphasis circuit consisting of IC102, IC103, Q102 and Q103.

Thereafter, the signal is fed again to pin 2 of IC101 after passing through the high frequency preemphasis circuit. Then it is clamped and mixed with the key pulse supplied to pin 4 of IC101 to detect AGC errors.

The AGC error signal is used to control AGC amplifier gain. The video meter is driven by integrating the AGC error. Further, RV110 is used to adjust video meter calibration.



3-3. High Frequency Preemphasis Circuit (on VO-12 Board)

The noise canceller in the PB system eliminates not only noise but also minute signals. Consequently, it causes picture quality to be inferior. The high frequency preemphasis circuit emphasizes these minute signals before they are recorded, thus avoiding picture quality degradation.

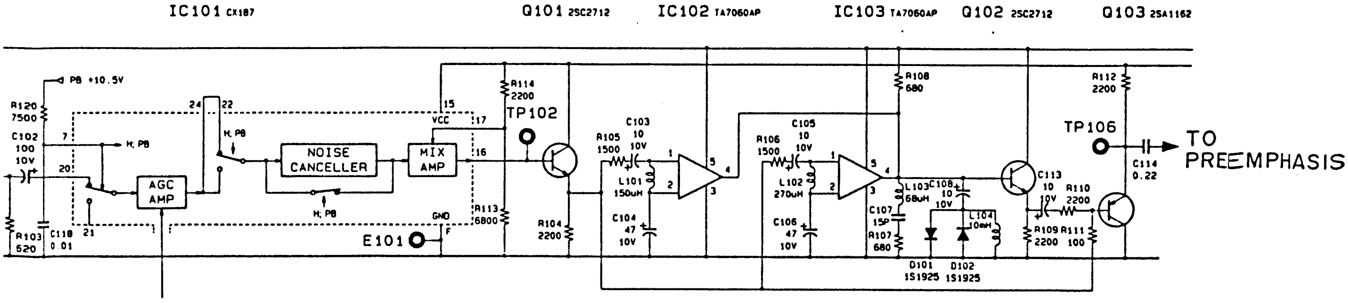
The illustration below shows the circuit diagram of the high frequency preemphasis circuit.

The Y signal at the emitter of Q101 branches into IC102 and IC103 passing through the high-pass filter. These HPFs provide different cutoff frequencies.

The 2 stage high-pass filter can be used with the 2 different types of noise cancellers in this PB system. (For further information, see" Noise Canceller".)

The limiters separately consist of IC102 and IC103 and are used to output minute signals. Large amplitude signals cannot be issued from these limiters.

The diode limiters separately consist of D101 and D102 and have a threshold voltage of ±0.4V. Moreover, any voltage greater than +0.4V or less than -0.4V cannot be output. The minute signal at the emitter of emitter follower Q102 is mixed with the Y signal while passing through resistive network R110 and R111. The mixed signal is sent to the preemphasis circuit in the next stage.



3-4. Preemphasis Circuit (on VO-12 Board)

A circuit diagram is shown below. A differential amplifier is comprised of transistors Q107 and Q109. The Y signal is fed from the high frequency preemphasis circuit to the base of Q107 through Q105.

The signal fed to differential amplifier Q107 occurs at the collector of Q109 in the same phase. The signal at the collector of Q109 is fed through emitter-followers Q110 and Q112 to the FM modulator. Q110's output signal is fed back to the base of Q109 through the de-emphasis circuit.

In this manner, Q110's output is pre-emphasized by incorporating the de-emphasis circuit into its feedback loop.

A white clip circuit, comprised of transistors Q115 and Q116, and a dark clip circuit, comprised of transistors Q118 and Q121, constitute the feedback loop.

The white clip circuit keeps the voltage at the base of Q110 equal to or less than $+V_{BE}$ at the base of Q115. The dark clip circuit keeps the voltage of Q110 equal to or greater than $-V_{BE}$ at the base of Q121.

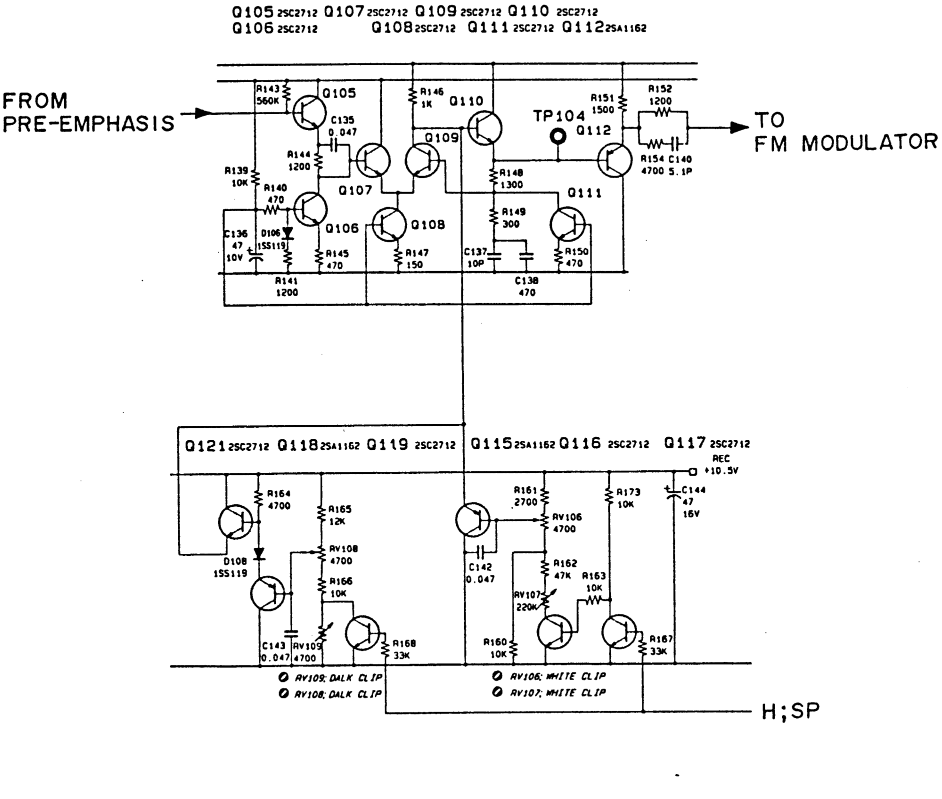
Transistors Q117 and Q119 are used to select operations in either the SP mode or conventional mode. Both the white and dark clip circuits should be set at different positions for every mode.

The adjusters are as follows:

RV106: White clip adjustment
in the SP mode - 230%
RV107: White clip adjustment
in the conventional mode - 220%
RV108: Dark clip adjustment
in the SP mode - 120%
RV109: Dark clip adjustment
in the conventional mode - 100%

First set the white and dark clip adjustment volume in position using RV106 and RV108 in the SP mode. Then set them in position using RV107 and RV109 in the conventional mode.

Further, set the other adjustment volume in the BVU-150P video system to the SP mode. After this, set them to the conventional mode.



3-5. Modulator Circuit (on VO-12 Board)

After passing through the preemphasis, white clip and dark clip circuits, the signal is fed from TP104 to transistors Q112 and Q113 to compensate for the frequency response sent to the FM modulator.

When the voltage at the base of Q113 changes, the voltage at the collector of Q113 also changes. At this time the FM carrier frequency output at pin 13 of IC101 can be shifted.

The sync tip carrier frequency in the SP mode can be set by adjusting RV104, and the carrier frequency in the conventional mode can be set by adjusting RV105.

The Y signal passes through a 4.43 MHz trap circuit. L108 and C139 comprise this trap circuit.

Normally, SL101 is shorted and the trap circuit is continuously operated to eliminate the 4.43 MHz leaking component.

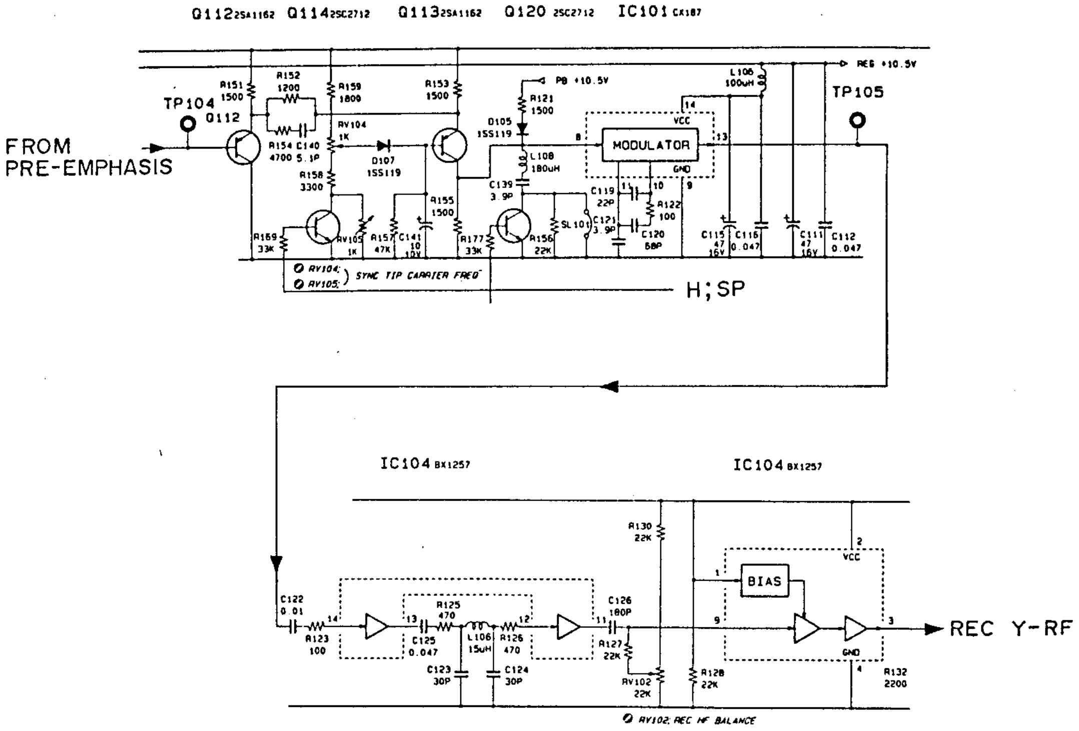
This signal is fed to pin 8 of IC101 to accomplish frequency modulation.

3-6. REC HF Circuit (ON VO-12 BOARD)

The REC HF (high frequency) circuit consists of the BX-1257 IC104 on the VO-12 board. The BX-1257 circuit diagram is shown above.

The Y FM signal is fed from pin 14 of IC104 to pin 13 of IC104 through the buffer amplifier in IC104. Then it is fed to L106, C123 through C125 and R125 which comprise an LPF to eliminate the third harmonics. The LPF output signal is fed from pin 12 of IC104 through the amplifier in IC104 to pin 11 of IC104. The signal occurring at pin 11 of IC104, is fed through C126, R127 and RV102 which comprise a bias circuit, to pin 9 of IC104. Thereafter, it is fed to the limiter in IC104.

RV102 is used to minimize the second harmonics component at pin 3 of IC104. In this manner, the second harmonics distortion caused by a limiter can be suppressed.



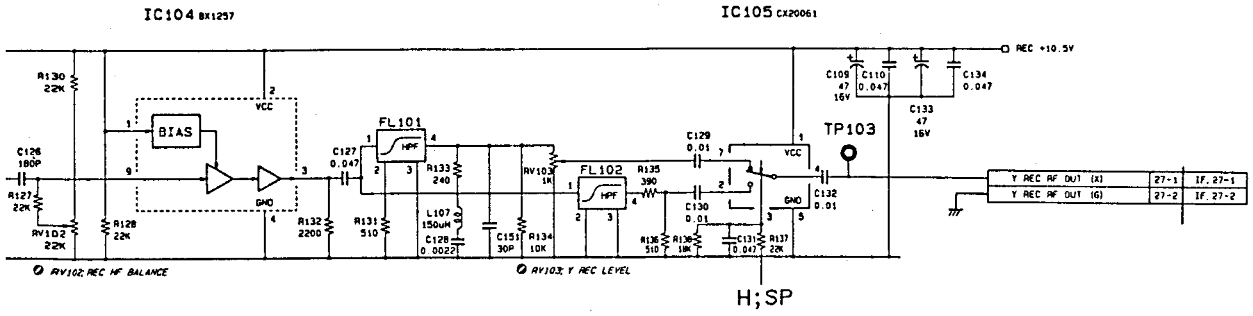
The Y FM signal occurring at pin 3 of IC104 is fed to an HPF to pick up the signals in the desired Y FM frequency band.

The HPF used in the conventional mode is labeled FL101 and that used in the SP mode is labeled FL102. The chroma RF signal frequency is allocated away from the Y RF signal frequency during the SP mode. This occurs if the frequency span in the SP mode is compared with that in the conventional mode. The group delay of the FM signal in the SP mode can be minimized by gradually cutting off the chroma RF bandwidth using an HPF FL102.

The recording current can be controlled by RV103 on the VO-12 board during the conventional mode, and it can be controlled by an adjuster on the RP-24 board during the SP mode.

First, adjust the recording current in the SP mode then that in the conventional mode.

The carrier frequency occurring in the SP mode is higher than that which occurs in the conventional mode. As the recording current decreases, the recording efficiency increases in the SP mode. The recording currents in the SP and conventional modes should be set at the appropriate values.



4-1-3. Pseudo-Lock Detection Circuit

The pseudo locking process for CX-859 will be explained below.

Assume that 473 fH (8 x 924 kHz) has become 481 fH due to some kind of shock. (ex. power-on sequence.) This means that the continuous wave signal frequency, 924 kHz, has become 924 kHz + fH. This may change the carrier and chroma signal frequencies as follows:

5.35 MHz carrier signal frequency

⟶ 5.35 MHz + fH

4.43 MHz chroma signal frequency

⟶ 4.43 MHz + fH

The phase error is detected in the APC loop every fH interval during the pilot burst period, and no error is detected in the APC loop even if the chroma signal frequency is shifted by fH. The APC loop is locked at 4.43 MHz + fH and this process is called pseudo locking.

The VCO output signal is counted in IC1 to detect pseudo locking as follows.

VCO OUT= 8 x 924 kHz
= 8 x (59 + 1/8)fH
= 8 x 473/8 fH
= 473 fH

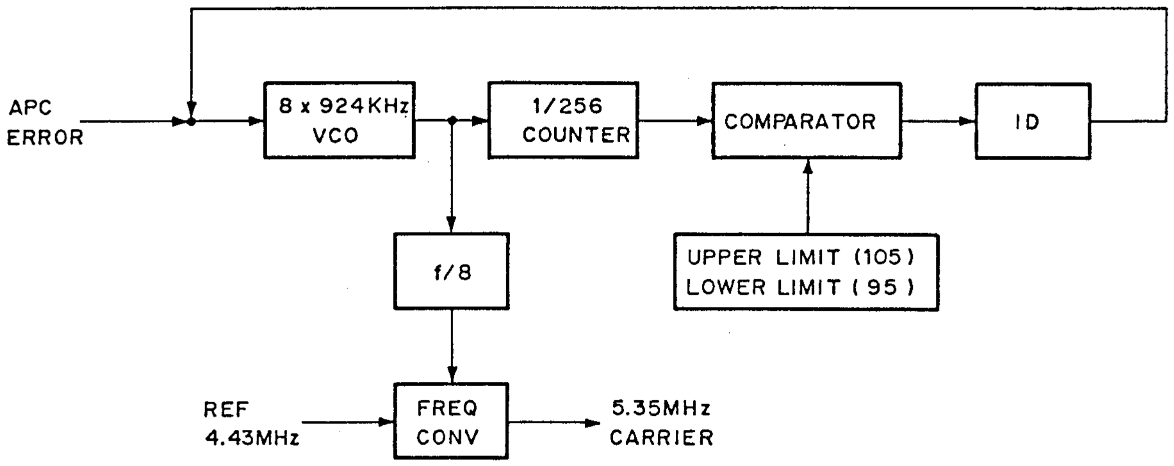
The VCO output signal is counted during the 4H period.

473 x 4H = 1892

The residual value in the x 1/256 counter becomes 100.

1892 - (256 x 7) = 100

This residual value is compared with the upper limit (105) and lower limit (95). If the residual value is out of the 95 to 105 range or the 924 kHz ± 2.4 kHz range, the APC-ID is output.



4-2. Low-Frequency Response Compensation Circuit

The down-converted 924kHz chroma signal is fed from the CR-26 board to pin 19 of connector CN22 on the VO-12 board.

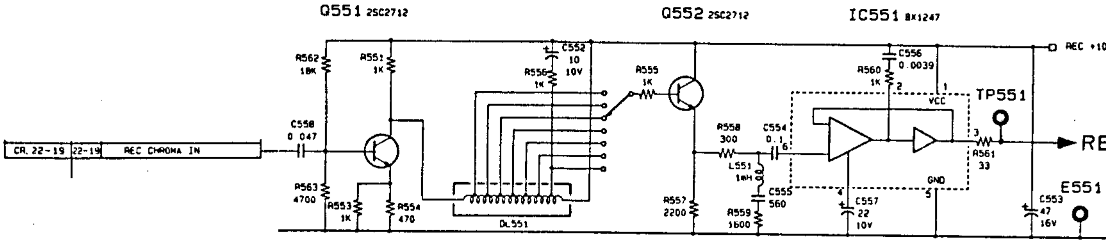
The chroma signal is fed to amplifier Q551 to compensate for the loss in delay line DL551 in the next stage. Delay line DL551's function is to match the PB chroma signal delay time with the PB Y signal delay time. The chroma signal is then fed from buffer Q552 to low-frequency response compensation circuit IC551.

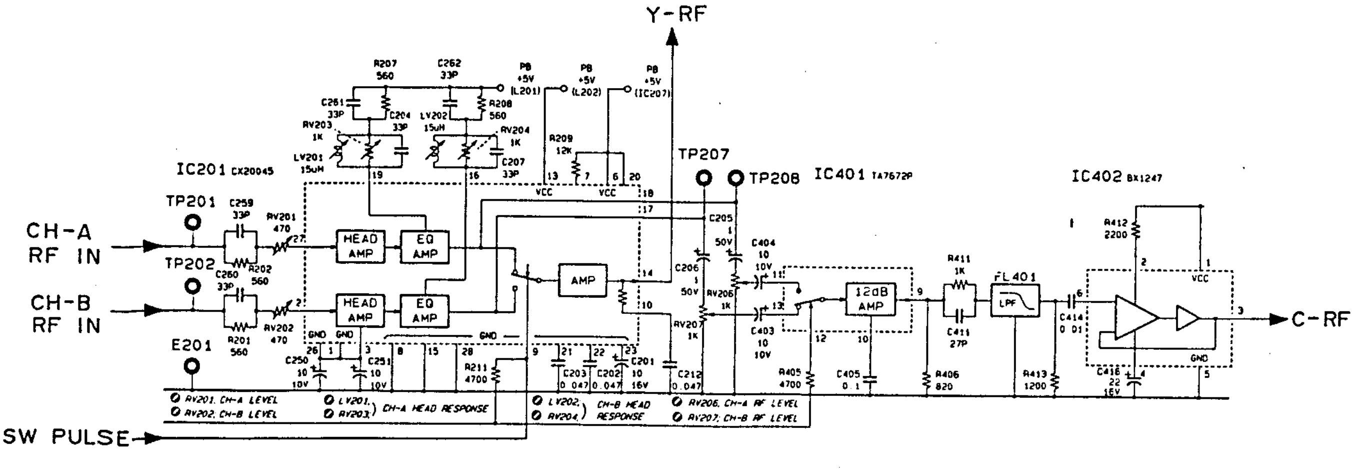
The chroma ringing has been suppressed through the phase compensation of the lower-frequency component and by chroma bandwidth expansion.

4-3. PB Chroma Processing

The RF chroma signals in channels A and B in the PB system are fed from pins 17 and 18 of IC201 to the switching circuit and 12dB amplifier in IC401 through level adjusters RV206 and RV207, respectively. The output voltage of amplifier IC401 occurs at pin 9 of IC401. The RF chroma signal is separated by LPF FL401 and is fed to 6dB amplifier IC402 (BX-1247).

The output voltage of the 6dB amplifier is fed to the RF Y/C delay adjuster circuit. The difference in delay time between the Y and chroma signals in the SP or conventional mode is separately set, to minimize this time, by using delay line DL401 in 50ns steps.





The PB YC delay in the SP mode can be adjusted only by using DL401. However, it is adjusted by using both DL401 and Q408 in the conventional mode.

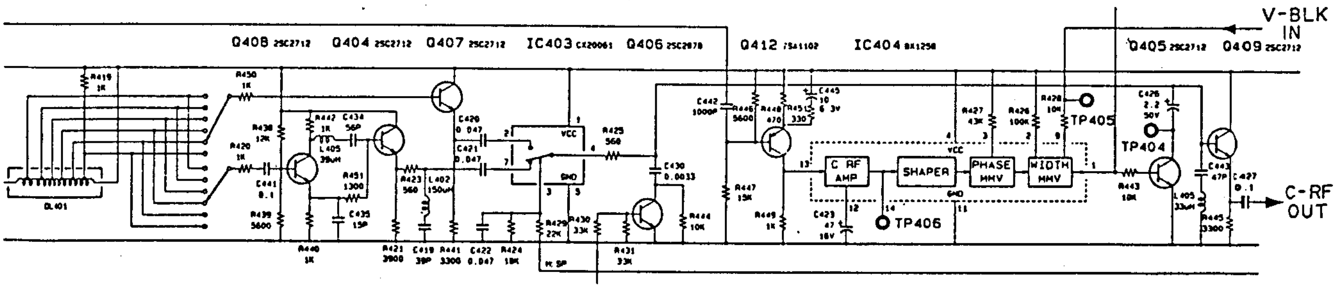
The RF chroma signals in the SP and conventional modes are fed through emitter followers Q407 and Q404 to switch IC403. Switch IC403 selects either the SP mode or the conventional mode. The output signal of switch IC403 at approximately 0.2Vp-p is fed through Q409 to pin 11 of connector CN22 on the VO-12 board. Whether the time code signal component is contained during vertical blanking of the chroma-RF signal is detected in IC404. If the time code signal is detected in IC404, Q405 turns on and the time code signal is muted.

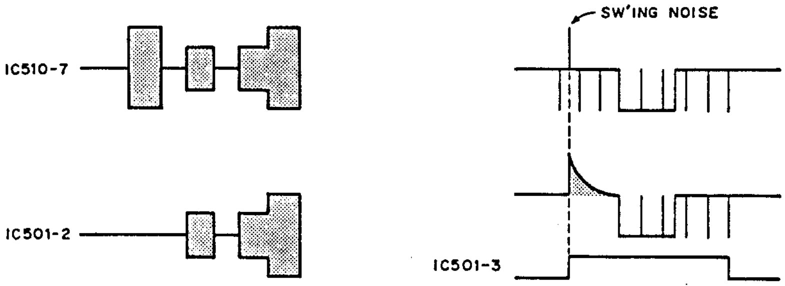
The chroma signal in the PB system is converted into the 4.43 MHz signal on the CR-26 board. Then it is fed to pin 7 of switch IC501 through pin 13 of connector CN22 on the VO-12 board.

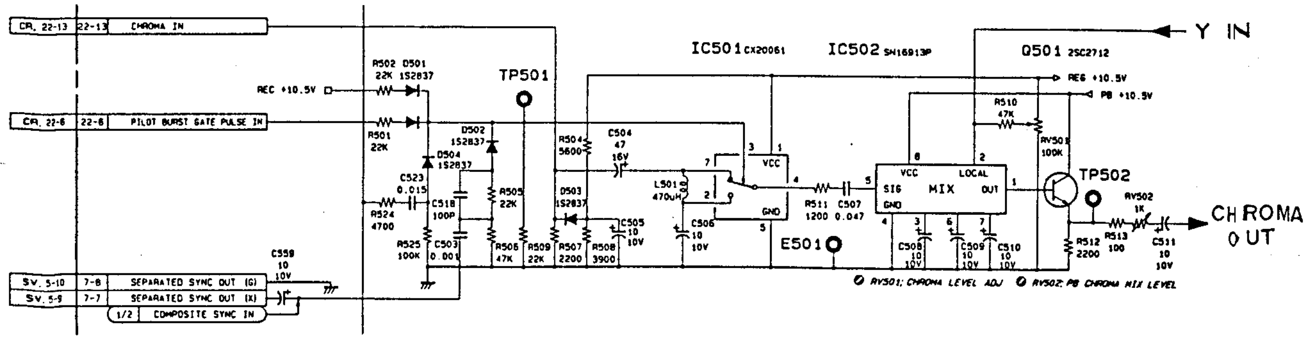
IC501 is used to reject unwanted components, the pilot burst signal and spikes due to RF switching, from the 4.43 MHz signal.

When a DC level difference has occurred at the RF switching point, it is differentiated and a spike noise is generated. It is integrated by the circuit's resistance and the converter circuit's capacitance, as shown below. Moreover, the 5.35 MHz carrier signal leaks because of this operation.

The signal which spikes are eliminated is sent to differential gain compensator IC502.





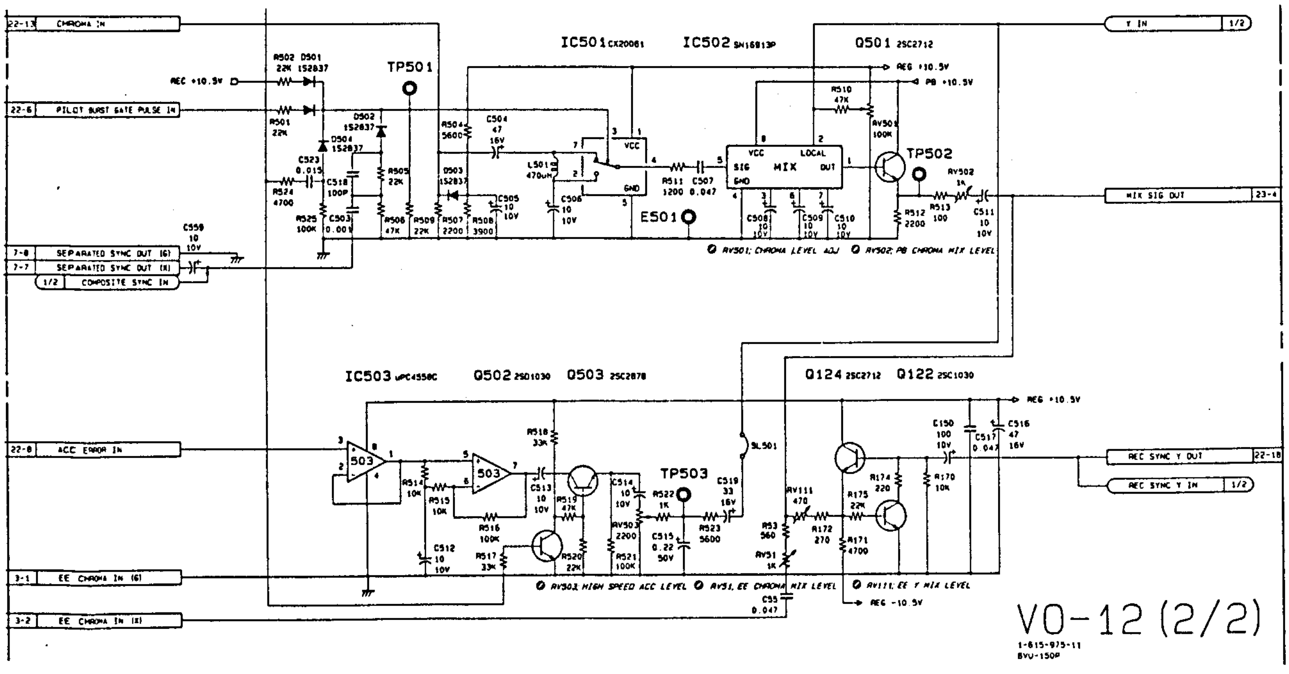


4-4. Differential Gain Compensator

When the down-converted chroma signal superimposed on the Y FM signal is recorded and played back, biasing can occur in the electro-magnetic conversion system due to chroma signal superimposition on the Y FM signal. However this superimposition degrades the differential gain of the color signal.

Distortion in the differential gain corresponds to the Y carrier signal, and the differential gain compensator realizes amplitude modulation with respect to the reversed Y signal amplitude to compensate for differential gain distortion.

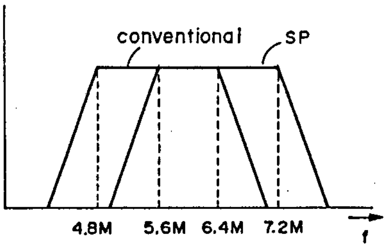
IC502 is used to accomplish amplitude modulation with respect to the reversed Y signal amplitude. RV504 is used to adjust the Y signal level for modulation purposes. The level-adjusted Y signal is fed to pin 2 of IC502 and the chroma signal is fed to pin 5 of IC502.



5. SP/CONVENTIONAL MODE DETECTION CIRCUIT

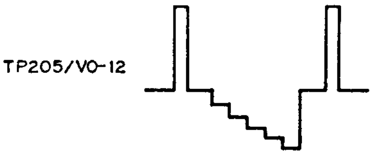
The RF signal is fed from the PB HF circuit to the demodulator then to IC202 and IC203 which comprize the SP/conventional mode detector.

The Y FM signals in the SP and conventional modes have the spectra shown on the right. The conventional mode of operation can be determined by detecting the 4.8 MHz sync tip carrier.



The output voltage of the HF circuit is fed to pin 16 of IC203 and LV203 is set to a value that enables the resonating frequency at the sync tip to be set at 4.8 MHz during the conventional mode of operation.

The demodulated signal waveform tuned to the sync tip occurs at TP205.

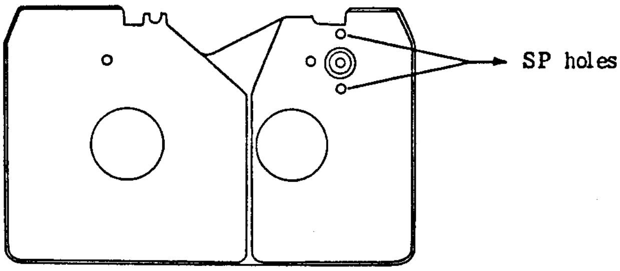


If the sync tip carrier cannot be detected in the IC203, the L:SP signal is sent from pin 3 of IC203 to timing detector IC202 in the next stage.

The KSP-S10 and KSP-S20 cassette tapes have an opening through which the SP mode is identified.

In the PB mode, the VTR operates in the SP mode both when the SP cassete is detected and when the conventional carrier is not detected. When the conventional carrier is detected, the VTR operates in the conventional mode even if an SP cassette is used. In the REC mode, the SP/conventional recording mode of the VTR is determined by cassette type detection.

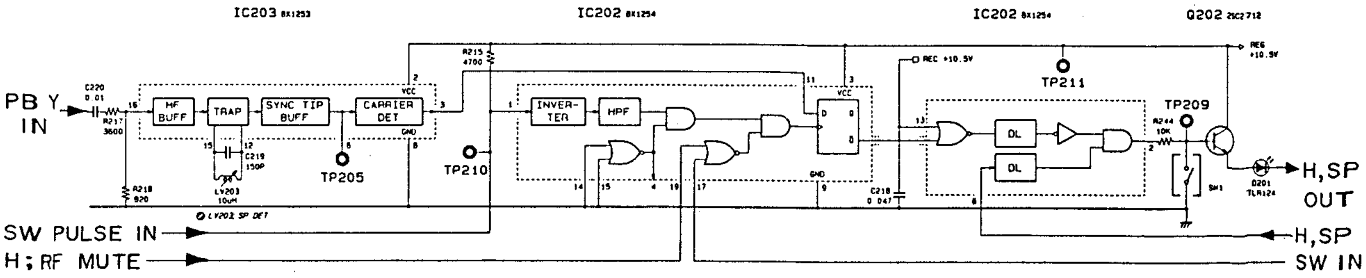
This particular operation is performed by IC202.



The H:SP or L:conventional signal occurs at TP209. LED D201 on the VO-12 board lights during the SP mode.

When switch S201 is on, the VTR is set to the conventional mode regardless of IC202 and IC203 operation.

When TP209 and TP211 are shorted, the VTR is forcibly set in the SP mode.



6. CONFI VIDEO CIRCUIT

The demodulator on the BF-12 board demodulates the RF signal played back by the confidence heads. The confidence picture is black and white since the audio FM detector IC2 HA12411 demodulates the confidence RF signal. Switch IC1 receives the confidence RF signals from CH-A and CH-B and is switched by the switching pulse for the confidence signal supplied from the servo board (SV-57C). The RF signal passes through the HPF composed of C4, L1, R7, and C5, and is sent to pin 1 of IC2.

The RF signal is demodulated in IC2 and output at pin 6. The demodulated signal passes the LPF and is de-emphasized by C9.

It passes through the CONFI VIDEO amplifiers Q1 and Q2, and goes to the CHARACTER DATA MIX circuit and SY-22A board. This circuit mixes the confidence video signal with characters that indicate the amount of tape left. The confidence video signal and the character data are fed to pin 2 and pin 1 of IC3, respectively.

When inserting characters, the L:CHARACTER BACK signal turns the switch to pin 1 and the character data is output at pin 15.

The level of characters is set by R17 and R19. The background level is set by R17 and R18.

The confidence video signal output at pin 14 of IC3 is fed to pin 3 of the switch IC3, which selects either the confidence video or LINE video. Its control signal is applied to pin 9. The video amplifiers Q4, Q5 and Q6 send the confidence video signal or the LINE video signal to a camera.

The line video signal should be output when the L:VIDEO CH-B REC signal is fed to D3.

SECTION 5
AUDIO CIRCUIT

1. OUTLINE

(1) A C-type Dolby noise reduction system employed in the BVU-150P improves the S/N ratio in line input by approximately 20dB more than conventional VTRs during Dolby ON operations.

(2) BVU-150P audio system input/output terminals, XLR-type connectors, are all balanced-type connectors. However, the input/output amplifier is composed of a balanced circuit instead of a transformer.

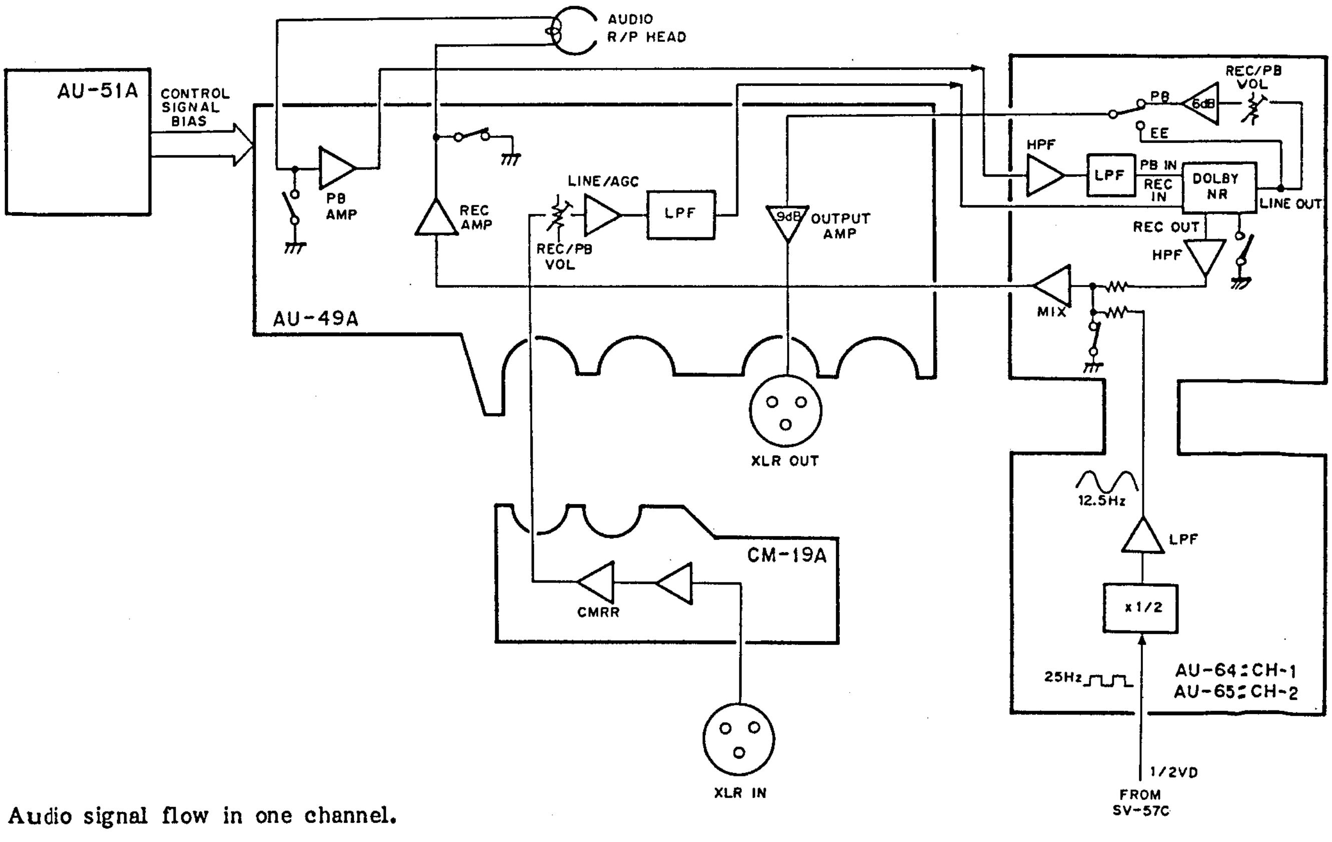
(3) The BVU-150P audio system primarily consists of AU-49A, AU-51A, CM-19A, AU-64 and AU-65 boards. Each board function is described below.

. AU-49A
This board is the main board in the audio system and consists of an audio signal recording/playback circuit.

. AU-51A
This board consists of two circuits: one to control each circuit mode and the other to generate bias and erase currents in the REC mode.

. CM-19A
This board is used to select the MIC/LINE/CAMERA input signal level, amplifies the input signal and sends it to the AU-49A board.

. AU-64/65
These boards consist of a Dolby encoder and decoder. Circuits in CH-1 and CH-2 are provided for the AU-64 and AU-65 boards, respectively.



Audio signal flow in one channel.

2. C-TYPE DOLBY NOISE REDUCTION SYSTEM

A C-type Dolby noise reduction system, used for the audio circuit of the U-matic SP, will be described here. The system provided with BX-1152 (IC) is used for the BVU-850P, BVU-150P and Betacam series, and is employed in one channel.

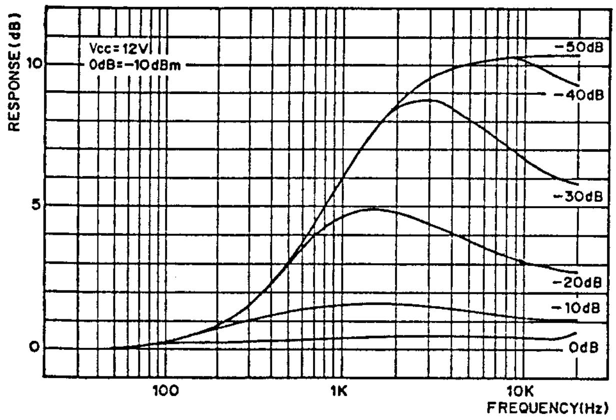
2-1. Dolby Encoding System

As shown in the illustration below, the C-type Dolby noise reduction system has the following encode characteristics. The system performs encoding in the REC mode and decoding with its reverse characteristics in the PB mode. This reduces tape hiss noises, that is, audible noises of 3kHz to 8kHz. The playback audio noise is almost the tape hiss noise during no signal is played back. However, audio signal can be monitored as if the S/N ratio of the PB signal is improved by the Dolby system.

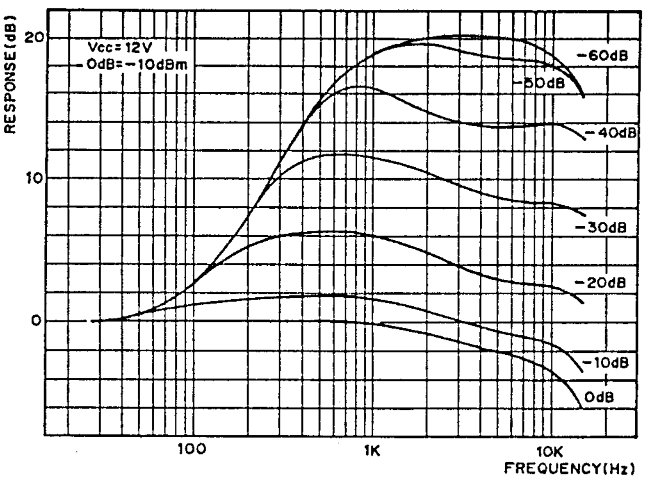
The illustration below shows the block diagram of Dolby IC in the REC mode. The REC IN signal fed to Dolby IC is sent through a line amplifier to the spectral skewing.

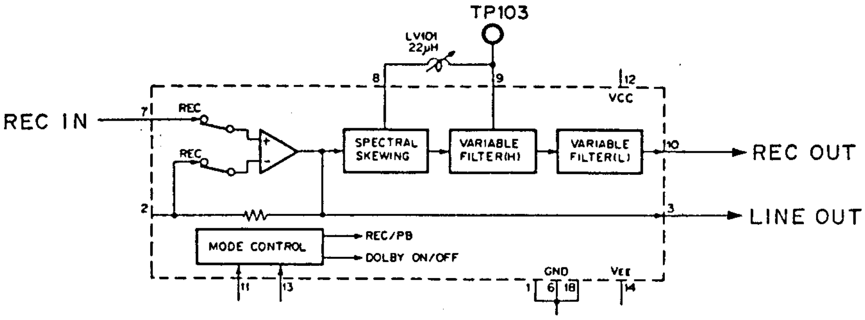
This spectral skewing, a serial resonance circuit with a resonance frequency of 20kHz, suppresses high-frequency component of which frequency is higher than 10kHz so that saturation can be prevented when recorded on tape. LV101 and LV102 adjust the resonance frequency.

B TYPE ENCODE CHARACTARISTICS



C TYPE ENCODE CHARACTARISTICS



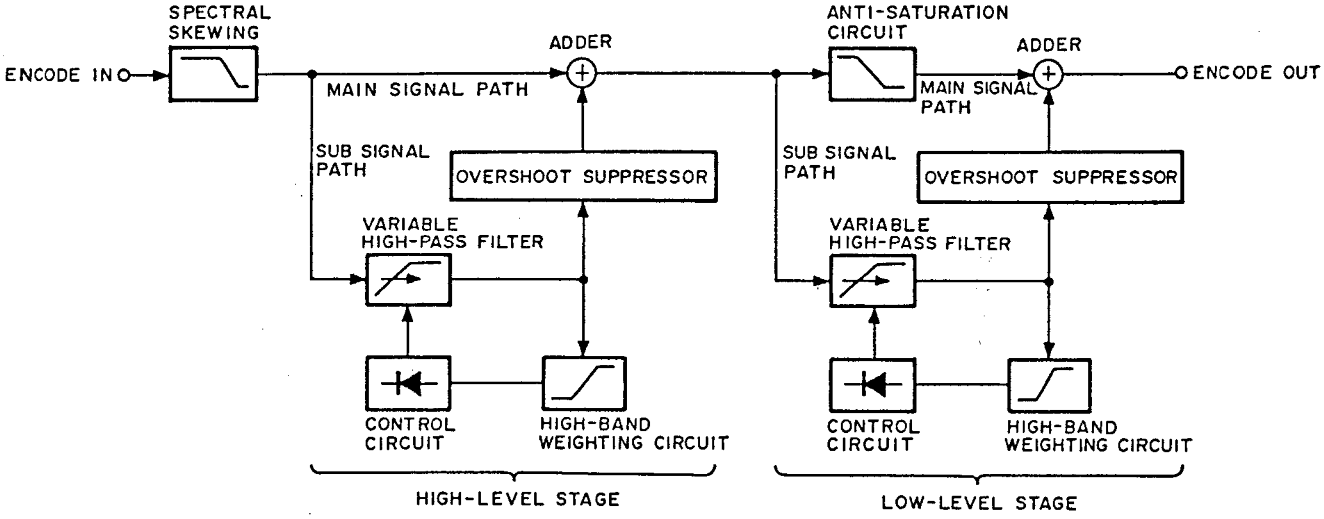


C Type Dolby NR System in the REC Mode

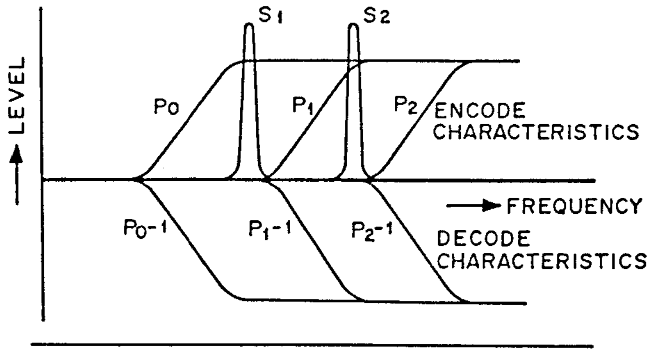
Output from spectral skewing is fed to the high-level stage. This high-level stage consists of both main signal and sub-signal paths.

The sub-signal path provides a variable high-pass filter and constitutes a high-pass filter which can change the cutoff frequency. This is called the sliding band system. According to this system, the cutoff frequency of the high-pass filter is shifted to a higher frequency so that the high-level signal is not encoded and only the low-level signal can be encoded.

At this point, the main and sub-signals are added and fed to the next low-level stage. Although its main signal path contains an anti-saturation circuit, this low-level stage performs the same function as the high-level stage. This circuit is used to lower high-frequency gain in the main signal path and to lower the high-frequency saturation level. The C-type Dolby system enables noise suppression by 10dB in the high-level and low-level stages, respectively (20dB in all).



Block diagram of encoder (recorder) circuit in C-type Dolby system



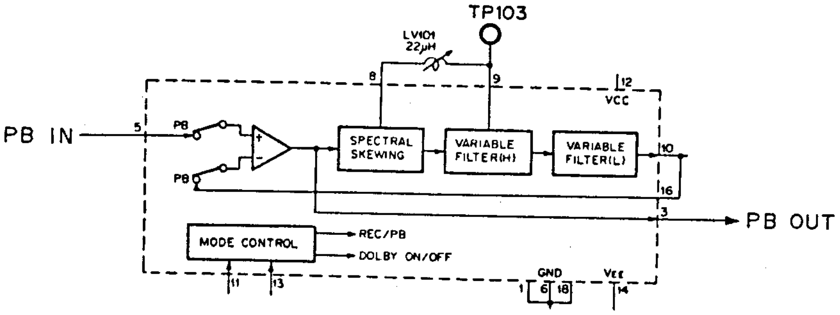
Noise suppression based on Dolby system (sliding band system)

2-2. Decoding System

The encoded signal is decoded in the PB mode. The decoder is opposite both in configuration and function to the encoder. Spectral skewing, variable filter (high) and variable filter (low) are provided in the negative feedback loop of the first-stage line amplifier as shown in the block diagram.

The situation shown in the above diagram allows the encoder to operate as a decoder.

Encoding and decoding characteristics vary depending on the signal level in the REC and PB modes. Consequently, a input level change to Dolby IC results in fluctuations in output frequency response.



C TYPE DOLBY NR SYSTEM IN THE PB MODE

3. PLAYBACK SYSTEM

AU-49A BOARD

Since the playback systems in channels 1 and 2 are identically configured, only channel 1's playback system will be described here.

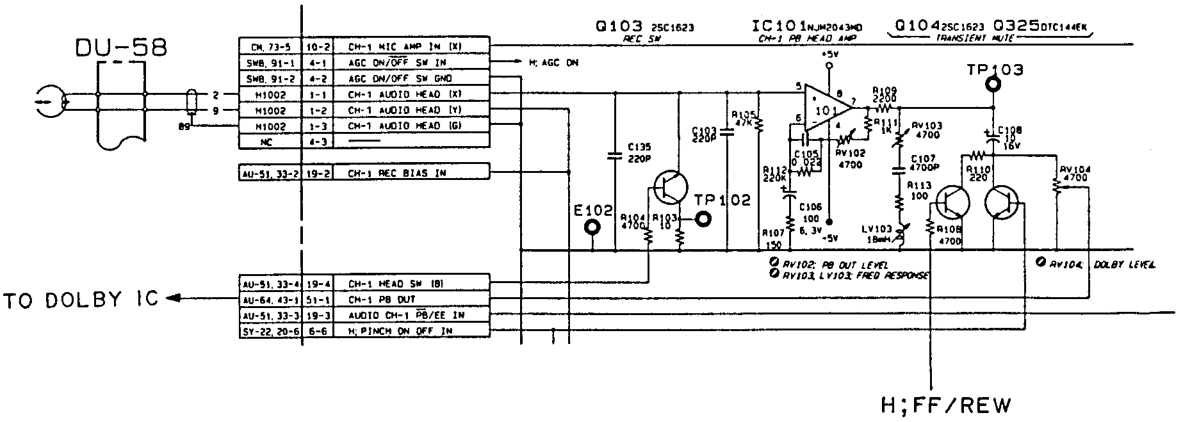
3-1. Head Amplifier

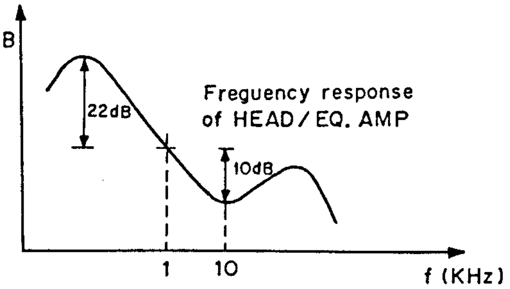
The CH-1 audio signal played back by the audio head is input to pin 5 of head amplifier IC101 where its frequency response curve is adjusted.

R111, RV102, C105, R112, C106 and R107, connected between pins 7 and 6 of the head amplifier, determine the frequency response curve. LV103, C107, R113 and RV103 function as a 17kHz trap and adjust the high frequency response curve of the playback signal from the head. The Q103 switch mutes the head amplifier during recording. The CH-1 HEAD SW (B) signal (CN 19-4) controls Q103. The collector of muting transistor switch Q103 is grounded via resistor R103 to minimize the bias voltage of the signal line when the emitter is grounded, and to prevent fluctuation of the ground line when the transistor is turned on and the current flows. The R103 is connected to the collector of Q103 to measure the bias current and the signal current at TP102.

Q104 turns on in the farst forward or rewind mode.The output level at TP103 is attenuated by breede resistors R109 and R110. In the farst forward or rewind mode, approximately a 10dB dropped audio is output. The H:FF/REW signal from the SY-22 board controls Q104.

Using an H:PINCH ON OFF signal, Q325 mutes the playback signal at the moment of pinch plunger ON/OFF operation to mute the pop noises.


DU-58
2
9
89
CN, 73-5 | 10-2 | CH-1 MIC AMP IN (X)
SWB, 91-1 | 4-1 | AGC ON/OFF SW IN
SWB, 91-2 | 4-2 | AGC ON/OFF SW GND
H1002 | 1-1 | CH-1 AUDIO HEAD (X)
H1002 | 1-2 | CH-1 AUDIO HEAD (Y)
H1002 | 1-3 | CH-1 AUDIO HEAD (G)
NC | 4-3
AU-51, 33-2 | 19-2 | CH-1 REC BIAS IN
AU-51, 33-4 | 19-4 | CH-1 HEAD SW (B)
AU-64, 43-1 | 51-1 | CH-1 PB OUT
AU-51, 33-3 | 19-3 | AUDIO CH-1 PB/EE IN
SY-22, 20-6 | 6-6 | H; PINCH ON OFF IN
TO DOLBY IC
H; AGC ON
Q103 2SC1623
REC SW
IC101 NJM2043MD
CH-1 PB HEAD AMP
Q104 2SC1623 Q325 DTC144EK
TRANSIENT MUTE
+5V
-5V
TP103
TP102
E102
C135 220P
R104 4700
R103 10
C103 220P
R105 47K
C105 0.022
R112 220K
C106 100 6.3V
R107 150
RV102 4700
R109 2200
R111 1K
RV103 4700
C107 4700P
R113 100
LV103 18mH
C108 10 16V
R110 220
R108 4700
RV104 4700
RV102: PB OUT LEVEL
RV103, LV103: FREQ RESPONSE
RV104: DOLBY LEVEL
H;FF/REW



Freguency response of HEAD/EQ. AMP

Dolby Decoding (AU-64 Board)

The audio signal's frequency response is corrected using head amplifier IC101. It is then fed to the AU-64 board after the playback signal level, that is, the input level to the next-stage Dolby IC is adjusted by RV104. The playback audio signal sent to pin 2 of switch IC9 on the AU-64 board is passed through high-pass filter IC1 of which cutoff frequency is 40Hz. That eliminates the 12.5Hz component of the pilot tone signal. Then, the pilot tone signal is suppressed to less than -50dB.

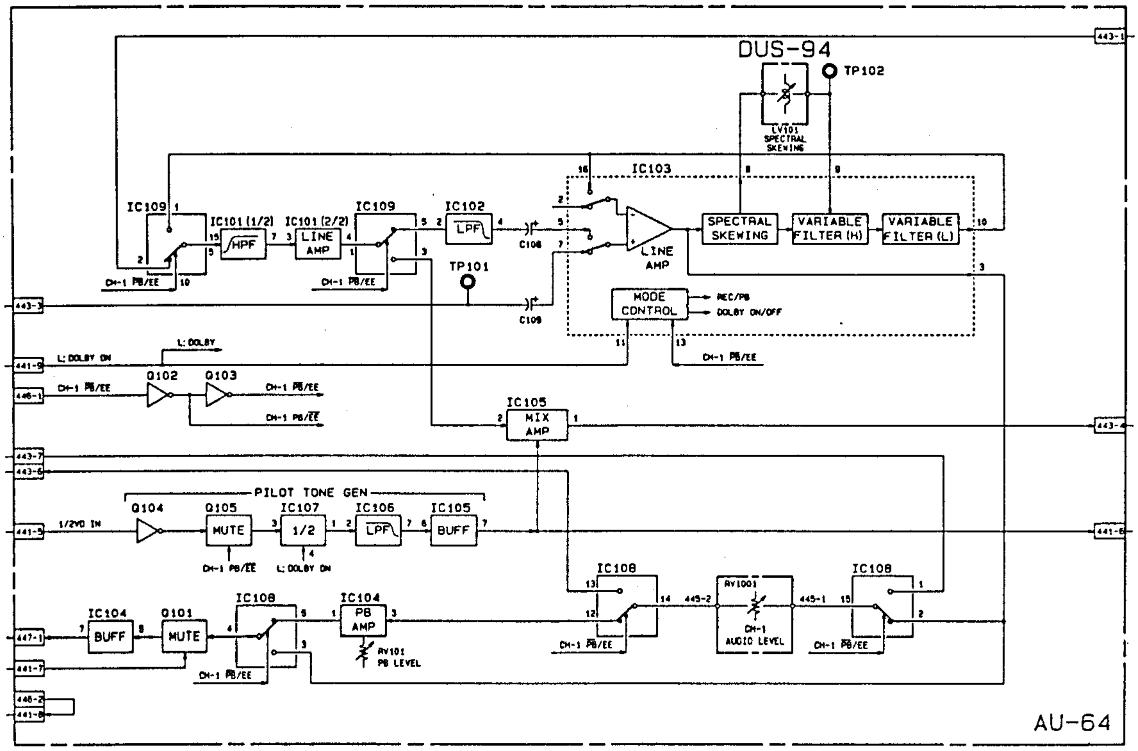
Pilot Tone Signal

The BVU-150P Dolby circuit is turned on or off using a Dolby ON/OFF switch on the side panel in both the REC and PB modes. In the BVU-850P, a Dolby select switch is operated only in the REC mode. Also, the pilot tone signal of 12.5Hz is mixed with the audio signal in the Dolby REC mode and the resulting mixed signal is recorded on tape. Consequently, pilot tone signal detection enables the Dolby circuit to be turned on in the PB mode. This prevents the occurrence of erroneous operations. The BVU-150P also records the pilot tone signal on tape in the REC mode, and the signal can be automatically detected when it is played back by the BVU-850P.

Then, the audio signal is amplified using line amplifier IC1 and passed through low-pass filter IC2 so as to limit its band. Moreover, it is sent to pin 5 of Dolby IC IC3, decoded and output to pin 3. The output signal is input to pin 2 of switch IC8 and sent to the REC/PB volume control on the front panel. The input signal in the REC mode is fed to pin 1 of switch IC8.

In the PB mode, the decoding characteristic (e.g. frequency characteristic) will be changed without passing of the signal through the PB volume control at the completion of Dolby decoding.

The signal which is level-adjusted using the PB volume control is sent back to the AU-64 board and input to pin 14 of switch IC8. Then, the input signal is amplified by approximately 6dB using IC4 in the next stage and fed to connector CN18-1 on the AU-49A board.



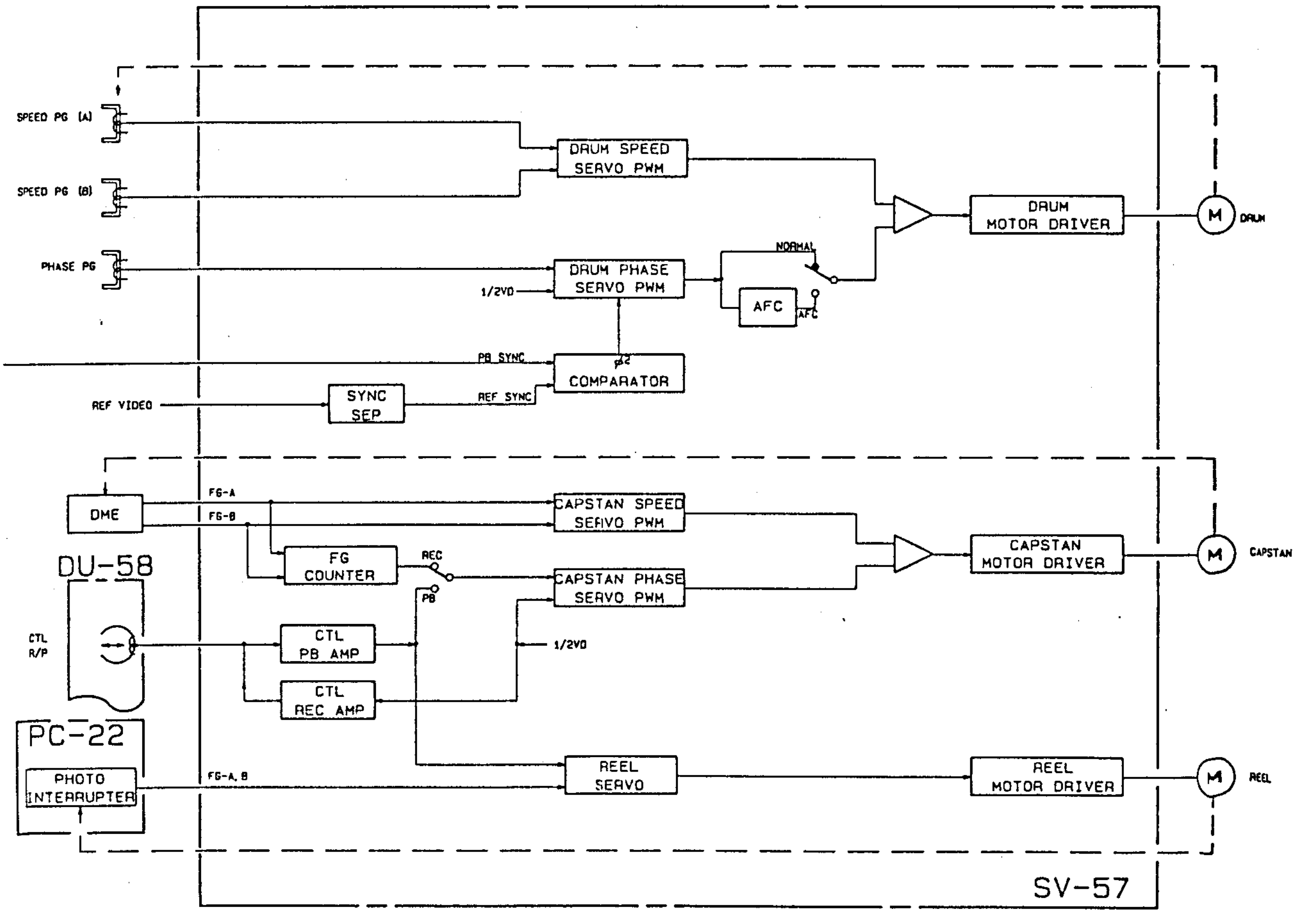
SECTION 6
SERVO CIRCUIT

General Description

The drum servo, the capstan servo, the reel servo and the CTL REC/PB amplifier are mounted on the SV-57C board. The drum and capstan servo employ the LSI CX-194B.

6-1. Drum Servo
    6-1-1. Drum Speed Servo
    6-1-2. Drum Phase Servo
    6-1-3. ϕ^2 (Phai Square) Servo
    6-1-4. Framing Servo
    6-1-5. Drum AFC Servo
    6-1-6. Motor Drive Circuit

6-2. Capstan Servo
    6-2-1. Capstan Speed Servo
    6-2-2. Capstan Phase Servo
    6-2-3. Instant Start Mode
    6-2-4. Brake Detection Circuit
    6-2-5. Tape Protection Circuit
6-3. Reel Servo
    6-3-1. Reel Speed Servo
    6-3-2. Reel Stop Detection Circuit
    6-3-3. Reel Constant Torque Drive Circuit
6-4. CTL Circuit
    6-4-1. PB CTL Circuit
    6-4-2. REC CTL Circuit
6-5. Sync Separator Circuit
6-6. Servo Lock
6-7. Switching Pulse Generator Circuit



6-1. Drum Servo

The servo circuit has the following function.

(1) Drum speed servo

The interval between speed PG A and speed PG B of the drum is measured, and its error is fed back to the drum motor.

(2) Drum phase servo

The drum phase PG is compared with the 1/2 VD, and the phase error is fed back to the drum motor.

(3) ϕ^2 (Phai square) servo

During playback, the ϕ^2 servo controls the drum phase so that the PB SYNC coincides with the REF SYNC.

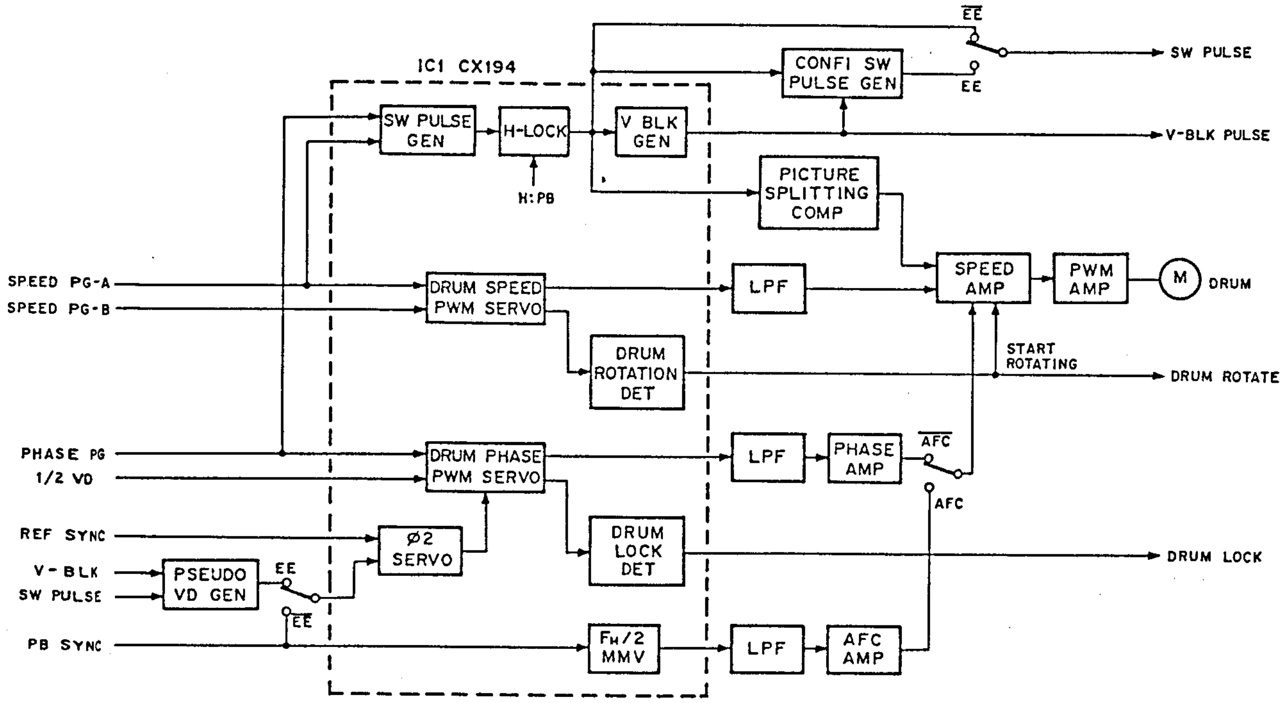
During recording, it controls the drum phase so that the pseudo VD coincides with the REF SYNC.

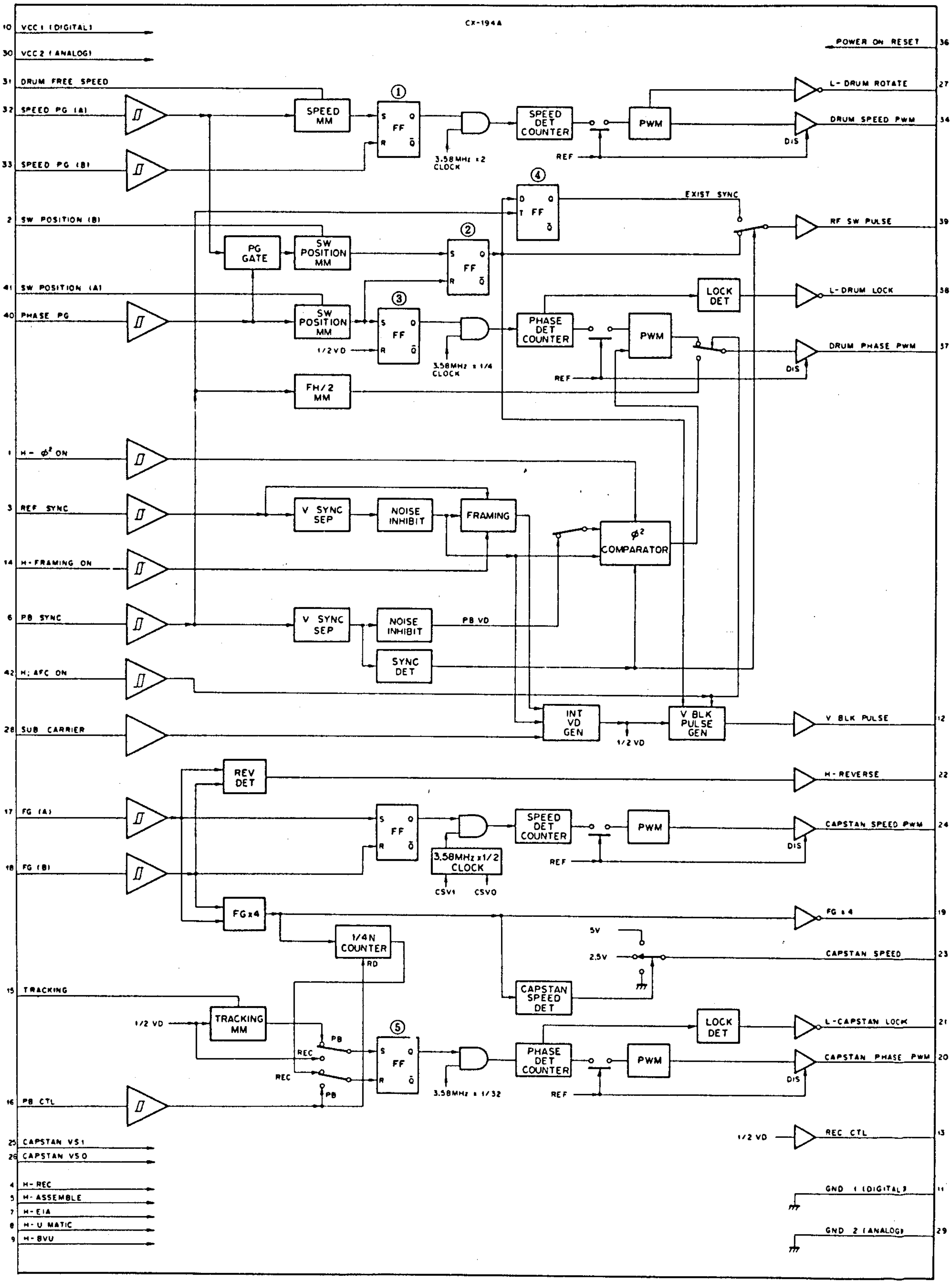
(4) Drum AFC servo

In the FF or REW mode, the drum AFC servo controls the drum speed so that the picture is locked in the monitor TV.

(5) Picture-splitting compensation

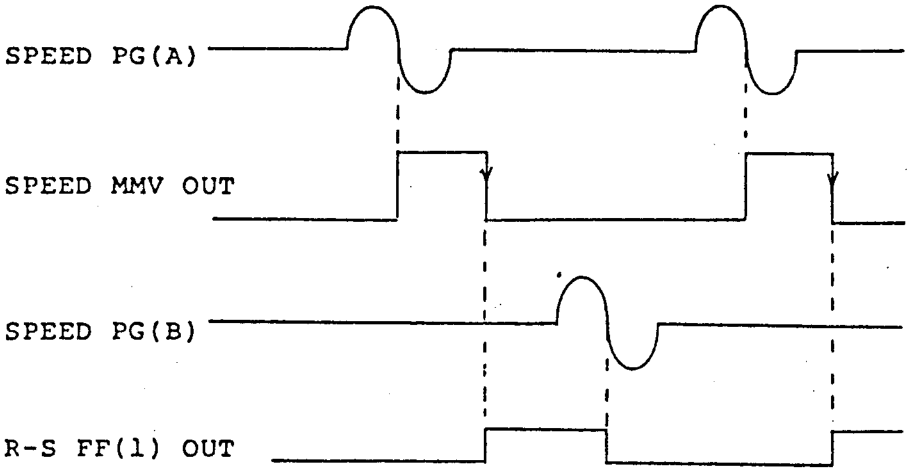
The 30 (25)Hz jitter component is generated from the switching pulse and supplied to the drum speed loop to cancel jitter.




CX-194A
10 VCC1 (DIGITAL)
30 VCC2 (ANALOG)
31 DRUM FREE SPEED
32 SPEED PG (A)
33 SPEED PG (B)
2 SW POSITION (B)
41 SW POSITION (A)
40 PHASE PG
1 H-ϕ^2 ON
3 REF SYNC
14 H-FRAMING ON
6 PB SYNC
42 H; AFC ON
28 SUB CARRIER
17 FG (A)
18 FG (B)
15 TRACKING
16 PB CTL
25 CAPSTAN VS1
26 CAPSTAN VS0
4 H-REC
5 H-ASSEMBLE
7 H-EIA
8 H-U MATIC
9 H-8VU
SPEED MM
①
FF
S
R
Q
$\bar{Q}$
3.58MHz ×2 CLOCK
SPEED DET COUNTER
REF
PWM
DIS
④
D
T
FF
EXIST SYNC
PG GATE
SW POSITION MM
②
③
1/2 VD
3.58MHz × 1/4 CLOCK
PHASE DET COUNTER
LOCK DET
FH/2 MM
V SYNC SEP
NOISE INHIBIT
FRAMING
ϕ^2 COMPARATOR
PB VD
SYNC DET
INT VD GEN
V BLK PULSE GEN
REV DET
3.58MHz×1/2 CLOCK
CSV1
CSV0
FG×4
1/4N COUNTER
RD
5V
2.5V
CAPSTAN SPEED DET
TRACKING MM
PB
REC
⑤
3.58MHz × 1/32
POWER ON RESET 36
L-DRUM ROTATE 27
DRUM SPEED PWM 34
RF SW PULSE 39
L-DRUM LOCK 38
DRUM PHASE PWM 37
V BLK PULSE 12
H-REVERSE 22
CAPSTAN SPEED PWM 24
FG ×4 19
CAPSTAN SPEED 23
L-CAPSTAN LOCK 21
CAPSTAN PHASE PWM 20
REC CTL 13
GND 1 (DIGITAL) 11
GND 2 (ANALOG) 29

6-1-1. Drum Speed Servo

Each rotation of the drum generates eight pulses of speed PG(A) and eight pulses of PG(B). The interval between PG(A) and PG(B) is measured and its error is used to control the drum speed. Speed PG(A) and speed PG(B) are input to pin 32 and pin 33 of IC1, respectively. In IC1, PG pulses are reshaped by the Schmitt circuit and trigger the monostable multivibrator. The output of this multivibrator is integrated by RV2, R6 and C10, and converted to a ramp signal, which is sliced by the 2.5V threshold voltage. Next, the delay amount is produced. RV2 adjusts the drum free speed by controlling the delay amount. The output of the speed monostable multivibrator sets the S-R flip-flop, and speed PG(B), after being reshaped, resets the S-R flip-flop. During the interval between the delayed PG(A) to PG(B), the output Q of the S-R flip-flop opens the AND GATE and lets 3.58(4.43)MHz x 2 clock out, which is supplied to the SPEED DET COUNTER. The counter counts clocks corresponding to the Q output. The counted data is fed to the Pulse Width Modulator (PWM), which then produces the PWM signal at pin 34 of IC1. Consequently, the task of the output pulse is proportional to the interval between delayed PG(A) and PG(B).



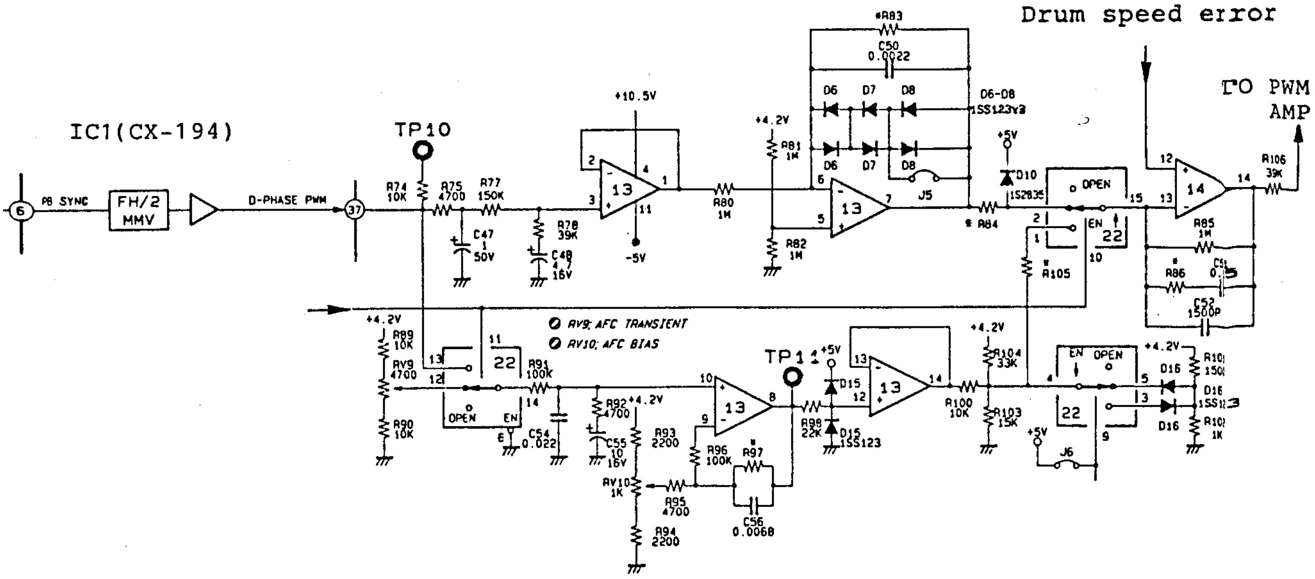
6-1-5 Drum AFC Servo

In the FF or REW mode, when the tape speed increases while locking the drum phase servo, the H frequency (FH) of the PB video changes and the monitor cannot lock the picture since the relative speed between tape and drum has increased. To obtain a locked picture, the drum phase servo loop is cut off and the drum speed is controlled to reproduce the constant FH. This circuit is called the AFC servo.

The AFC mode is set up by setting pin 10 of IC22. Instead of the phase servo PWM output at pin 37 of IC1, a 1/2H pulse made of PB SYNC is used as the AFC error. This error is integrated and applied to the drum servo loop so that the drum speed responds to the tape speed, and a constant FH is reproduced.

The AFC error is input to pin 13 of IC22. In the normal mode, IC22 outputs the DC voltage of pin 12 directly. The AFC transient adjustment RV9 presets the bias of the AFC loop so that locming is done quickly during the transition from the playback mode to the FF/REW modes (AFC modes). The drum phase PWM output of CX194 outputs the phase error or the AFC error, depending on the mode. However, each operating point is different. If the AFC loop is not cut off when the phase is locked, the wrong voltage is charged in C55 due to the high gain amplifier IC13. And when switched to the AFC servo, the picture will be out of H-synchronization until the correct operating voltage is given to C55 when the phase servo is operated. In the AFC mode, the input signal supplied to pin 13 of IC22 is phase-compensated and output at TP11 after passing through the error amplifier IC13. The AFC error is limited by IC22 and D16, and is output at pin 1 of IC22.

In the FF or REW mode when the blank tape comes to the video-recorded portion. the AFC servo cannot lock if the drum speed is out of lock range. The limiter limits the drum speed so that the AFC servo can lock it.

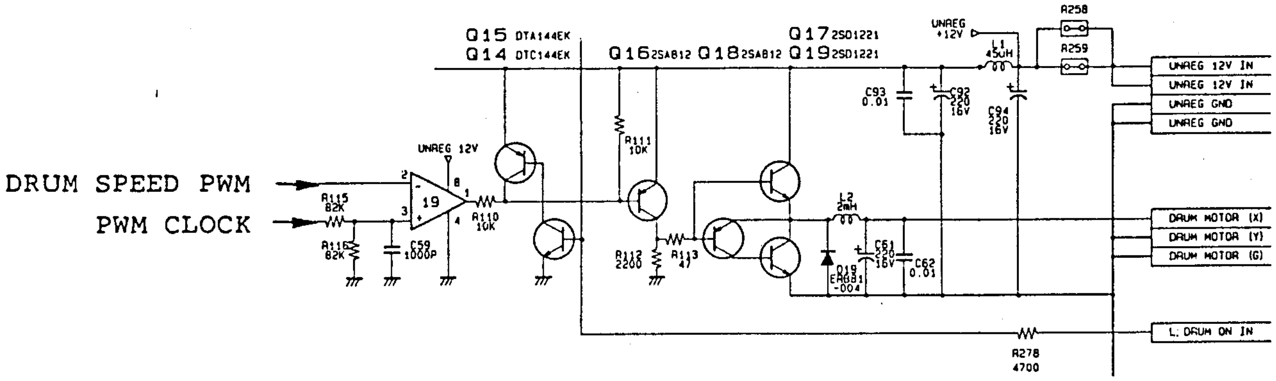


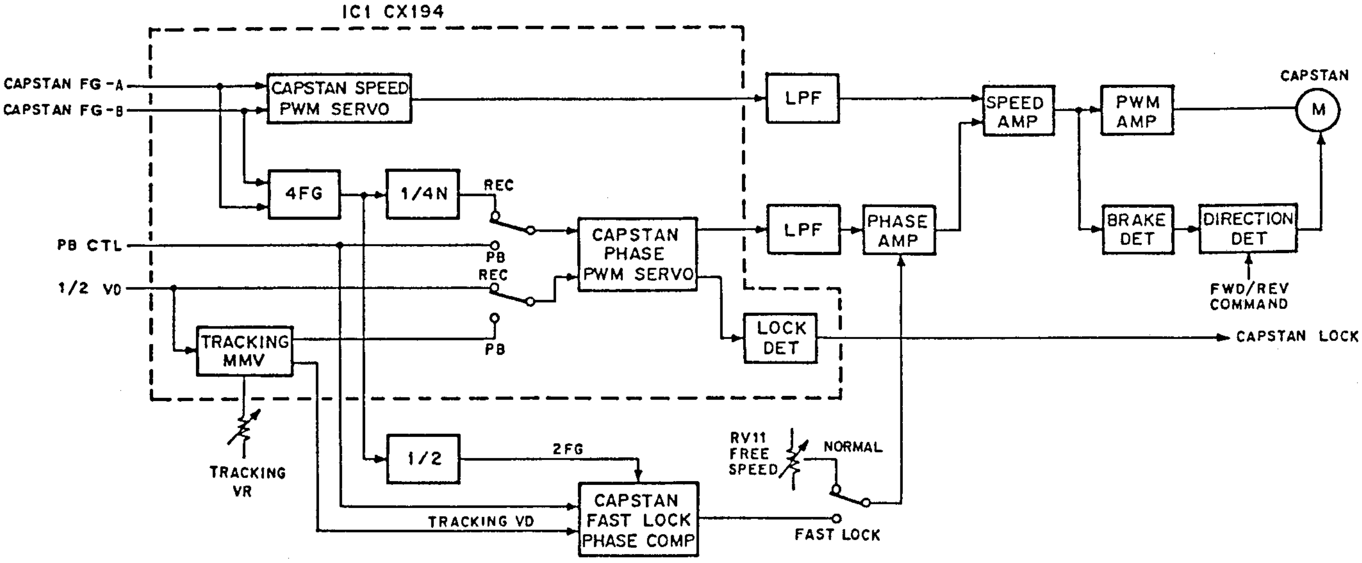
6-1-6. Motor Drive Circuit

The motor drive circuit for the drum, capstan and reel employ the PWM method. Their circuit configuration is almost the same.

The drum motor drive circuit compares the DRUM SPEED PWM fed to pin 14 of IC14 with the one of the phase, and outputs the error at pin 2 of IC19. The PWM clock (16KHz) sent from the SY-18 board via CN6-6 is limited by the 9.1V Zenner diode D18, and is converted to a sawtooth wave by R115, R116 and C59 supplied to pin 3 of IC19. Pin 1 of IC19 outputs a narrow pulse when the dc voltage input to pin 2 is high, and a wide pulse when the dc voltage is low. Its output is inverted by Q16 and applied to the base of Q17. When the dc voltage at pin 2 of IC19 is high, Q17 turns on for a long period of time, and the average dc level goes up. The output at the emitter of Q17 is rectified by the LPF (D19, L2, C61 and C62) and sent to the motor.

Q16 and Q17 amplify the current. When Q17 is off, Q18 and Q19 supply a reverse current to the motor to apply the brake.





6-2. Capstan Servo

Outline

The capstan servo includes the speed servo, the phase servo, and the reverse torque brake circuit. In the phase servo, the fast lock mode servo, which uses a microcomputer IC2 on the SY-22A board, is equipped for quick and stable assemble editing.

6-2-1. Capstan Speed Servo

The 450Hz capstan FG(A) and FG(B) sent from the capstan motor are input to pin 17 and pin 18 of IC1, respectively, where the speed is detected. The CAPSTAN SPEED PWM signal is output at pin 24 of IC1.

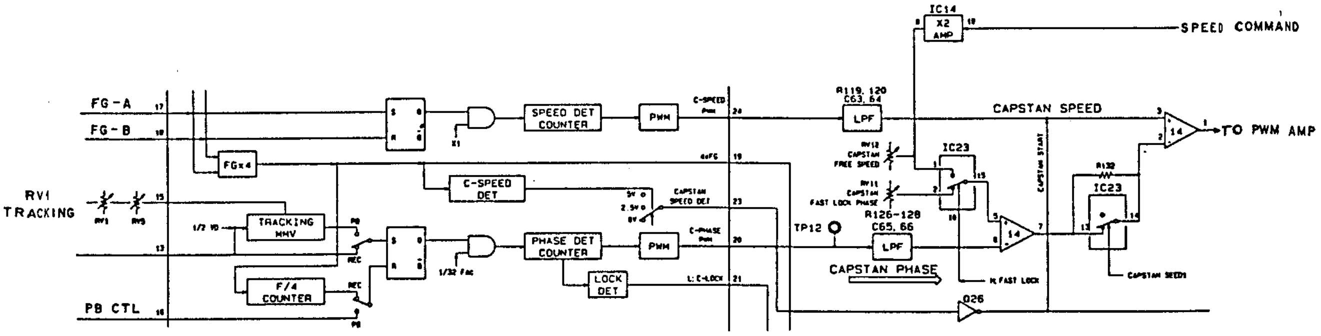
The CAPSTAN SPEED PWM passes the LPF (119, R120, C63 and C64) and is fed to pin 3 of IC14, where it is mixed with the CAPSTAN PHASE PWM. The output at pin 1 of IC14 is sent to the PWM amplifier IC20. Besides the normal speed, there are -1/3 and -1/6 times normal speed. These -1/3 and -1/6 capstan speeds are used in backspace editing and in releasing tape tension.

6-2-2. Capstan Phase Servo

The 1/2 VD signal produced in IC1 is delayed by the tracking monostable multivibrator, and becomes the TRACKING VD.

The phase error is detected by comparing the TRACKING VD with the PB CTL in the playback mode and with the counted down FG in the record mode. The detected phase error is output at pin 20 of IC1 as a CAPSTAN PHASE PWM signal, which passes the LPF (R126 and C65) and the phase compensator (R127, R128 and C66), and is fed to pin 6 of IC14(2/4). At pin 5 of IC14, the reference voltage for phase setting is applied by RV11 via the IC23 switch.

In IC14 (2/4), the CAPSTAN PHASE PWM is compared with the reference voltage, and the difference is output at pin 7. It is supplied to pin 2 of IC14 (1/4) and mixed with the dc component of the CAPSTAN SPEED PWM.



6-2-3. Instant Start Mode

In the recoding mode, when the REC PAUSE bottom is pressed, the capstan motor rewinds the tape for 4.5CTL length, and stops. Then, the recoding is resumed, the capstan motor reaches normal speed and the capstan phase servo locks instantly.

This function is called the fast-lock mode. Because of this, recording can start from the program junction. In the fast-lock mode, the phase of the TRACKING VD is compared with the PB CTL. Phase comparison is done every 2FGs(900Hz) using a microcomputer. By speeding up the comparison, the phase servo loop can respond quicker. In order to advance the tape in the reverse direction with the capstan motor, the capstan speed function of IC1 CX-194 is employed. The capstan speed can be changed by feeding the logic of capstan speed code 1 and code 2 to pin 25 and pin 26 of CX-194, respectively.

Capstan speed code 1 (IC1-25)	Capstan speed code 2 (IC1-26)	Capstan speed
L	L	x 1/6
L	H	x 1/3
H	L	x 1
H	H	x 2 (not used)

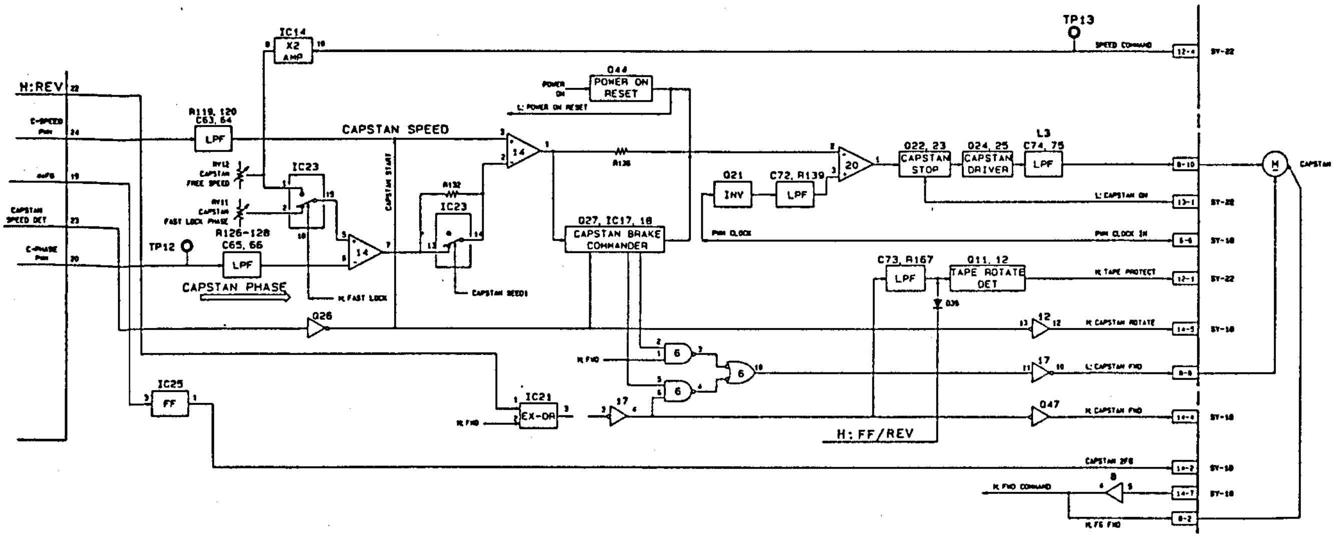
In the FAST LOCK mode, switch IC23 is turned to pin 1. The phase demodulated speed command from the instant microcomputer IC2 on the SY-22A board, passes the amplifier IC14 and is applied the reference voltage by RV12. Then it passes the switch IC23 and enters pin 5 of IC14.

The logic of capstan speed code 1 (pin 25) and 2 (pin 26) can select four modes of the capstan speed in CX-194 IC1 by changing the slope of the voltage to be sampled.

The gain of the demodulation is determined by the ratio of delta e to delta n. In these modes, the speed is slow, but the gain of the demodulation is high. Switch IC23 is turned off, and the 830K ohm resisters (R132 and R282) are inserted to reduce the gain of OP amplifier IC14.

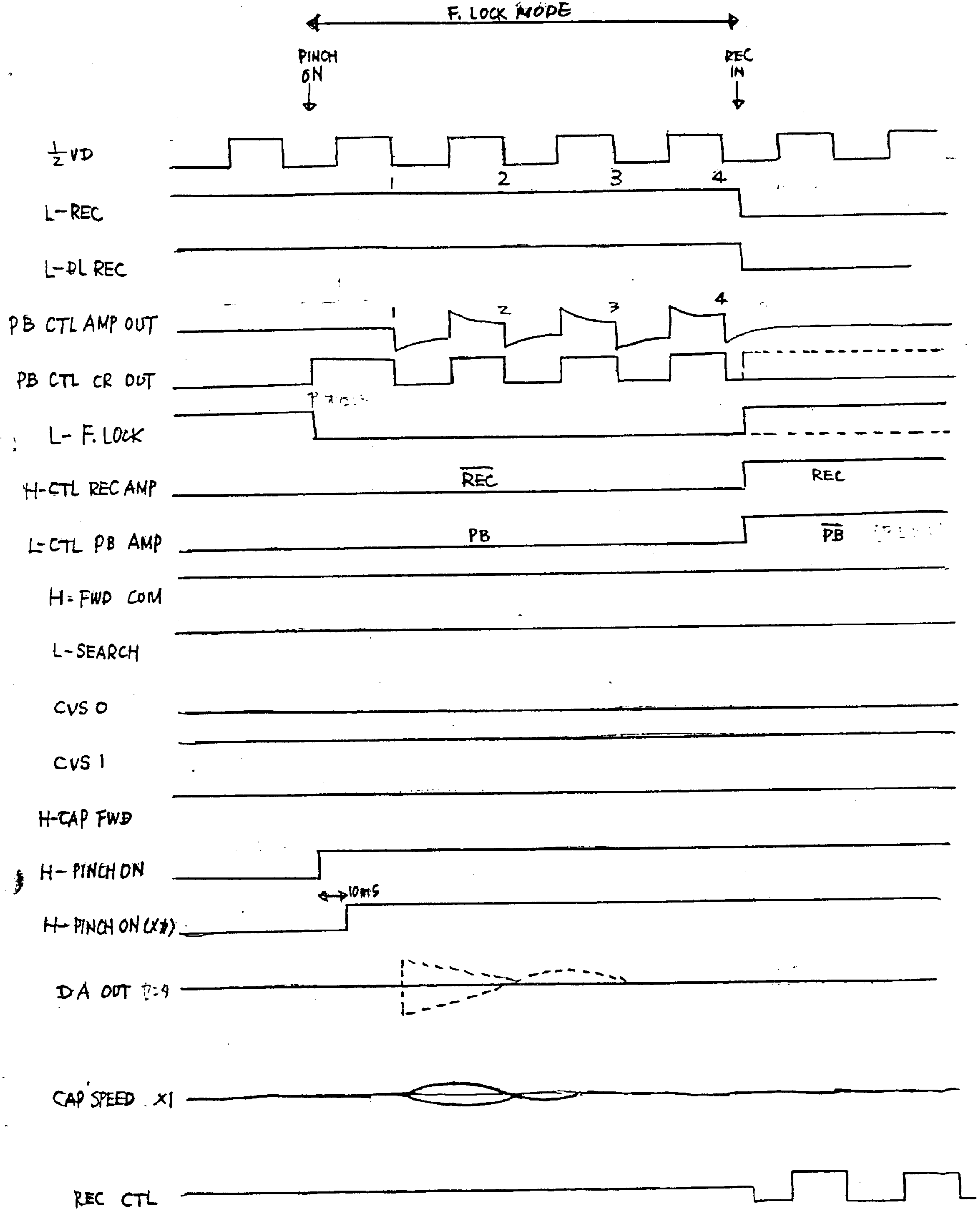
G = delta e / delta n
   = voltage / rotation

In the instant start mode, 2FG, TRACKING VD and PB CTL are sent to microcomputer IC2 on the SY-22 board, where the phase of the capstan is detected. 2FG is obtained by counting down 4FG output from pin 19 of IC1 CX-194 to 1/2 by the D-type flip-flop IC25. The 1/2 VD output at pin 19 of IC1 CX-194 passes the comparator IC16 and becomes the TRACKING VD. The PB CTL passes the CTL PB amplifier IC28, IC26, and the buffer IC8.



Used to
PSSI ✓

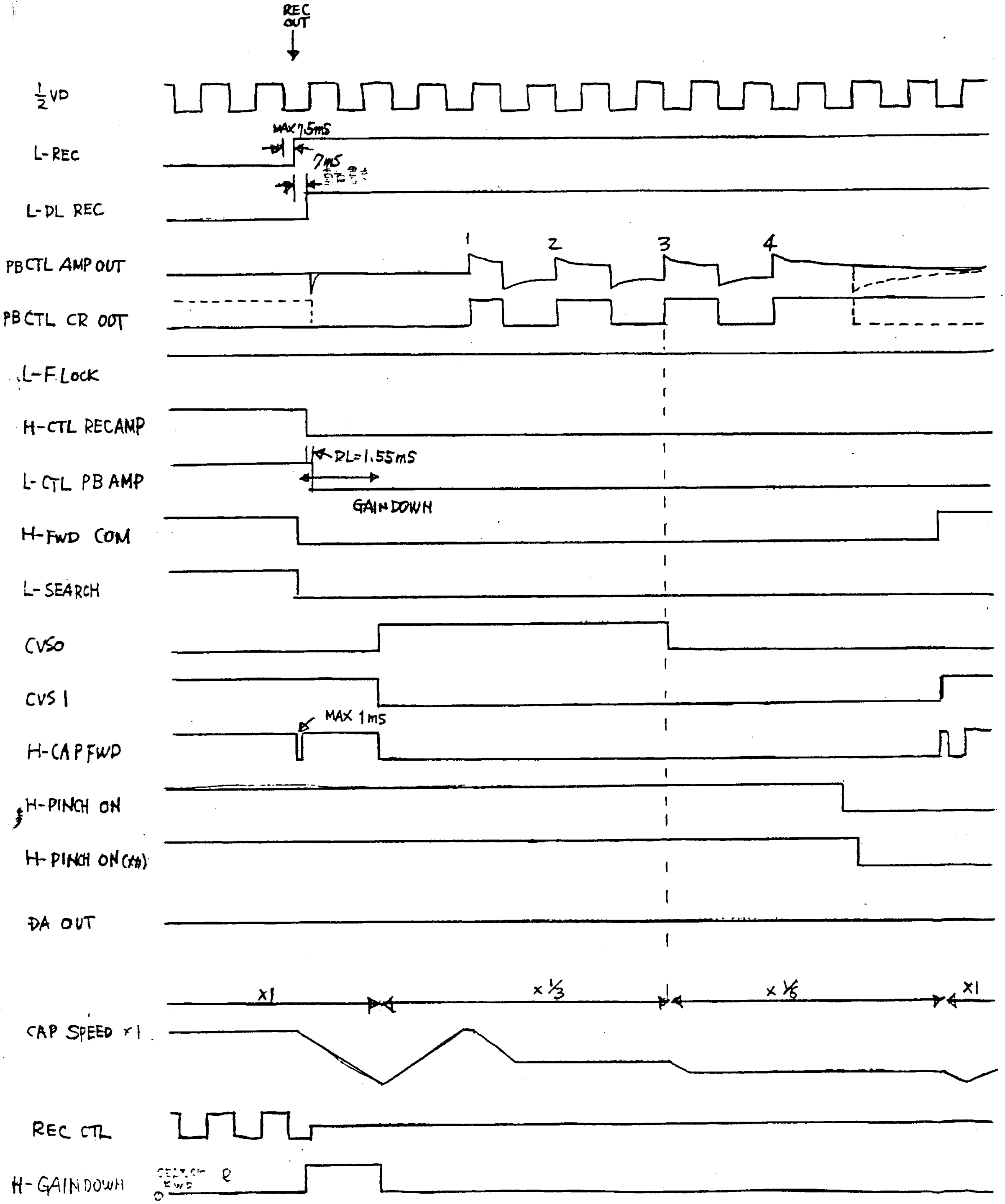
REC PAUSE OFF



F.Lock 遅れずん
CTL REC IN 早い) 現在
CTL PB 4で確定

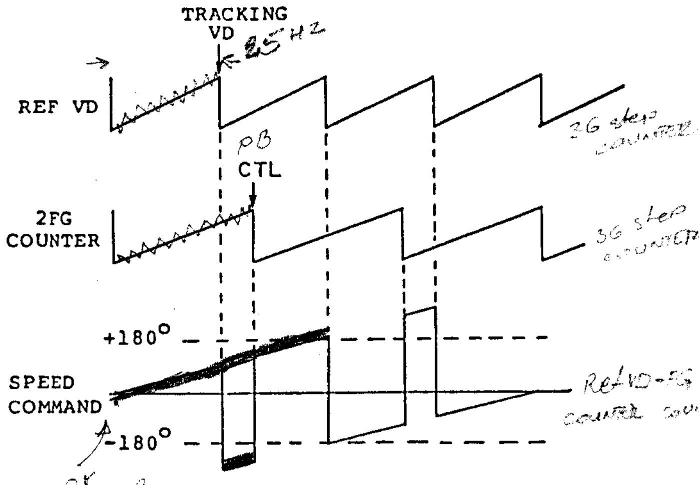
Used in 858.

REC PAUSE ON



前向信号ミスアリ
1/7 → 1/5 にて

The sawtooth wave made up of the TRACKING VD is compared with the sawtooth wave made up of 2FG and the PB CTL in the microcomputer where the phase is demodulated and the SPEED COMMAND is sent to the SV-57C board.



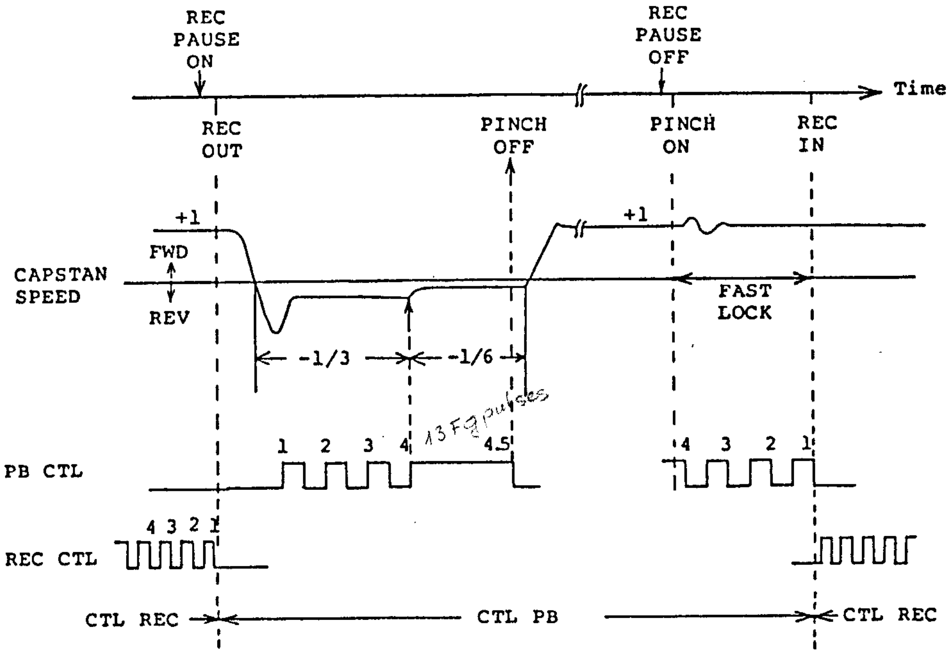
Phase demodulation method.

Fast lock operation

2FG = 900 Hz
PBCTL = 25Hz

During recording when the REC PAUSE button is pressed, recording is off; CTL is played back; and the capstan motor rotates in reverse. When the reverse mode is detected, the capstan speed changes to -1/3 times normal speed, and the recorded CTL is played back. And when the fourth CTL is counted, the capstan speed changes to -1/6 times normal speed and the pinch roller is disengaged after counting 13FG. The capstan is in standby mode while rotating in the normal speed. At this time, the tape has been stopped by the tape stopper.

Next, when the REC PAUSE mode is released, the pinch roller engages, and the VIDEO and CTL recording start again at the fourth CTL count. During the 4 CTL period from the pinch on to REC in, the FAST LOCK servo is executed.



6-2-4. Brake Detection Circuit

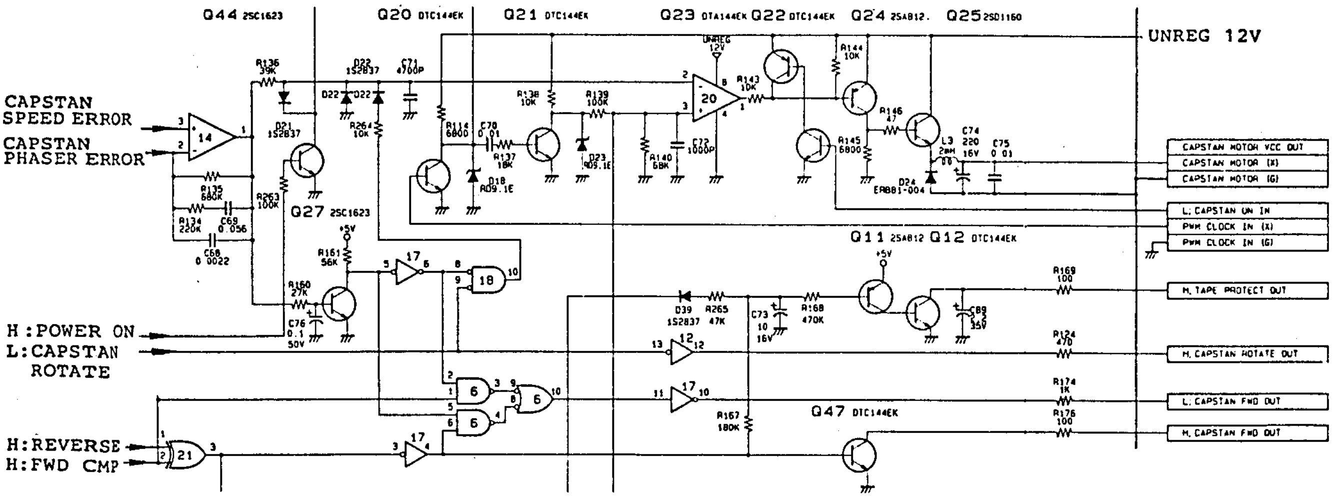
In order to decelerate the motor, the brake circuit consisting of Q27, IC17 and IC18 applies reverse torque. The output at pin 1 of IC14 is fed to the base of Q27. When the base voltage of Q27 drops to Vbe, Q27 turns off, and the collector outputs the H:BRAKE signal which passes IC17 and enters pin 8 of IC18 with the input logic, L:CAPSTAN ROTATE, at pin 9 of IC18, pin 10 of IC18 outputs the brake voltage through D22.

The logic of IC6 detects the rotational direction of the capstan. After receiving the state of the capstan rotation from CX-194 and commands from the system control (CN 14-7), pin6 of IC6 outputs the rotational command, L:CAPSTAN FWD OUT (CN 8-8), to the capstan motor.

6-2-5. Tape Protection

If the capstan rotates reversely for more than four seconds, Q11 and Q12 send a H:TAPE PROTECT signal to the SY-18 board via CN 12-1 to disengage the pinch roller to protect the tape.

In the FF or REW mode, the capstan stops to that Q11 and Q12 can not judge the direction of the capstan and misoperate. To prevent them from misoperating in the FF or REW mode, D39 cuts off this circuit.



6-3 Reel Servo

The reel servo circuit comprises the following circuitry.

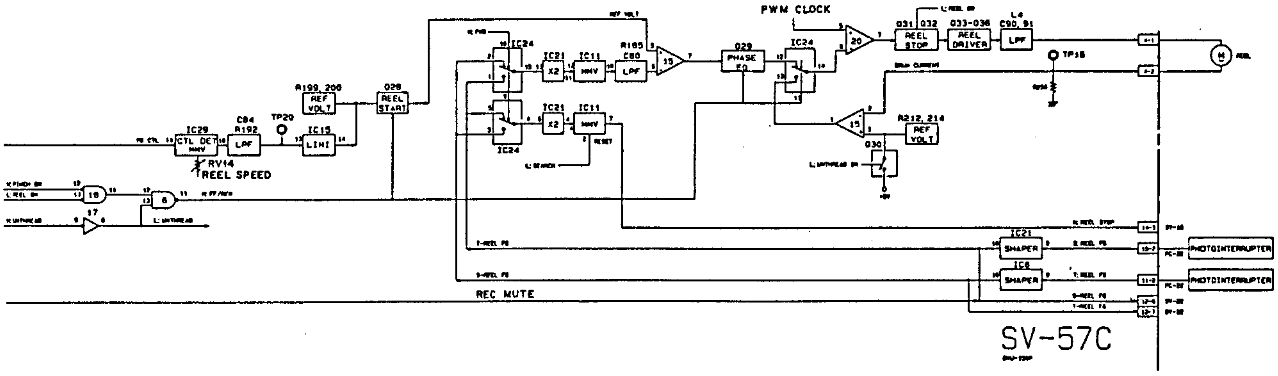
(1) The reel speed servo which reproduces the picture at tentimes normal speed in the FF or REW mode.

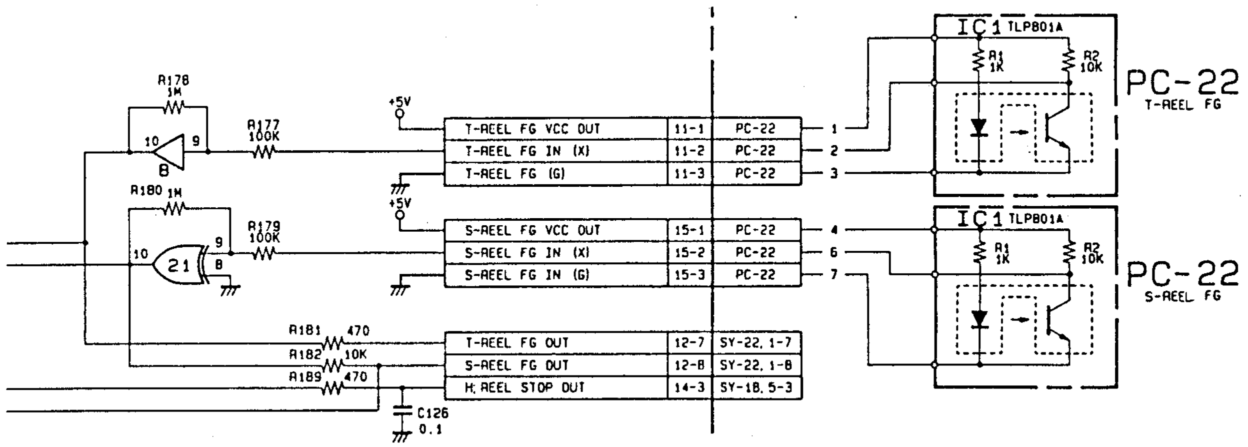
(2) The reel stop detection circuit.

(3) The constant drive circuit which drives the T-reel in the PLAY or REC mode.
The constant drive circuit which drives the T-reel or S-reel when unthreading.

6-3-1. Reel Speed Servo

The photointerrupters mounted on the PC-22 board generate T-REEL FG and S-REEL FG. T-REEL FG reshaped by IC8 is input to pin 2 of IC24. S-REEL FG reshaped by IC21 is input to pin 1 of IC24. The reshaped T-FG and S-FG are sent to the SY-22A board (via CN 12-7 and CN 12-8), where S-FG is used to detect the remaining time of the tape and where T-FG/S-FG are used to detect cassettes (KCS-10 or 20).





In the FF mode, the IC24 switch is turned to pin 1, and S-FG is doubled by the EXCLUSIVE OR IC21. Its width is held constant by the monostable multivibrator IC11. Its output passes the LPF (R185 and C80) and enters pin 6 of IC15.

R200 and R199 connected to pin 5 of IC15 determine the reference voltage used to set the speed.

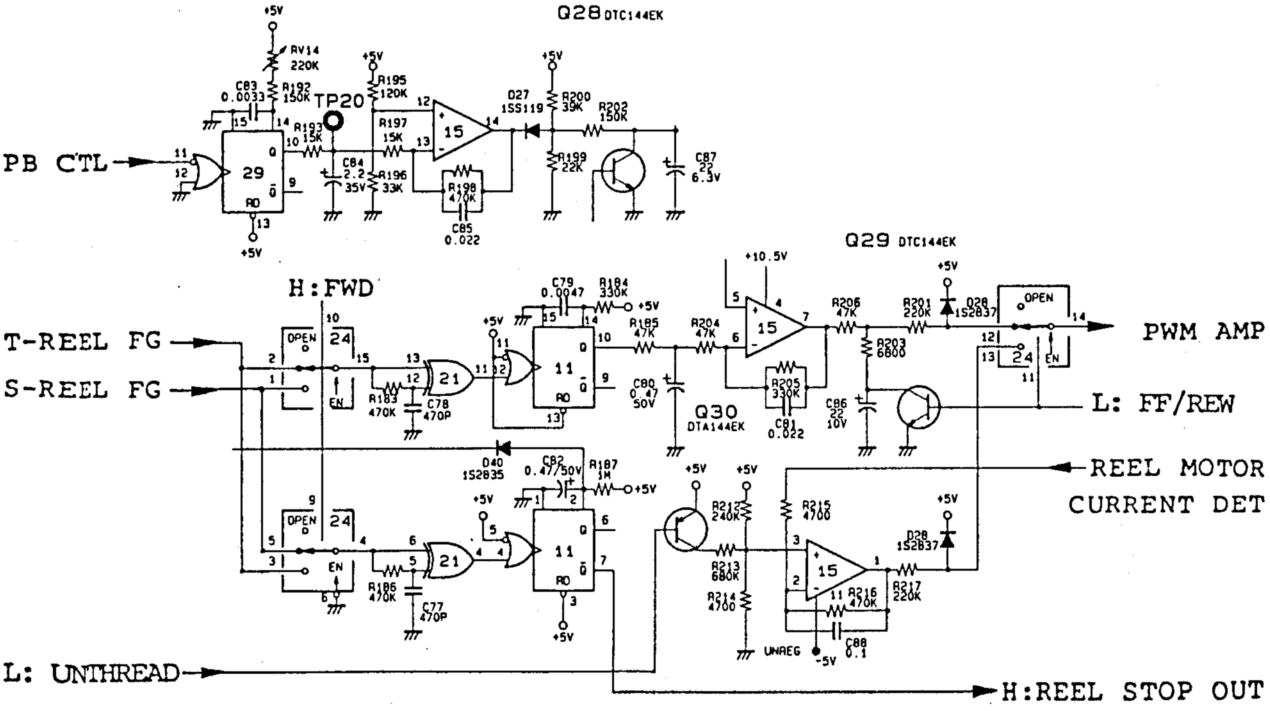
The signal compared with the reference voltage is output at pin 7 of IC15 and sent to the motor drivers via pin 12 and pin 14 of switch IC24.

Switch IC24 selects the speed servo and the constant torque drive. The reference voltage used to set speed is controlled by PB CTL. PB CTL is demodulated by the monostable multivibrator IC29, amplified by speed amplifier IC15 after passing the LPF (R193 and C84), and controls the reference voltage of R200 and R199.

In the REW mode, switch IC24 is turned to pin 2, and T-REEL FG is selected. That is to say, in either the FF or REW mode the REEL FG of the supply side is used for the servo. In modes other than FF/REW, Q28 and Q29 turn on and the servo is applied gradually due to the large time constant of C and R.

6-3-2. Reel Stop Detection

T-REEL FG and S-REEL FG are supplied to pin 3 and pin 5 of IC24, respectively. In each mode, REEL FG of the take-up side is selected. The FG output at pin 4 of IC24 is doubled by IC21 and fed to pin 4 of the monostable multivibrator IC11. In IC11, using the time constant between pin 1 and pin 2 of IC11, pin 7 of IC11 outputs the H:REEL STOP signal when the frequency of the pulse supplied to pin 4 of IC1 is low. The H:REEL STOP signal is sent to the SY-18C board via CN14-3. When the rotation of the take-up reel drops to 1/10 normal speed, the reel stop is detected.



6-3-3. Reel Constant Torque Drive Circuit

The constant torque drive circuit is composed of IC15 and Q30. The current of the reel motor is measured by the voltage across R256 (between TP16 and TP17). The measured voltage is fed to pin 2 of IC15 and compared with the reference voltage supplied to pin 3 of IC15. R212 and R214 determine the reference voltage of the constant torque.

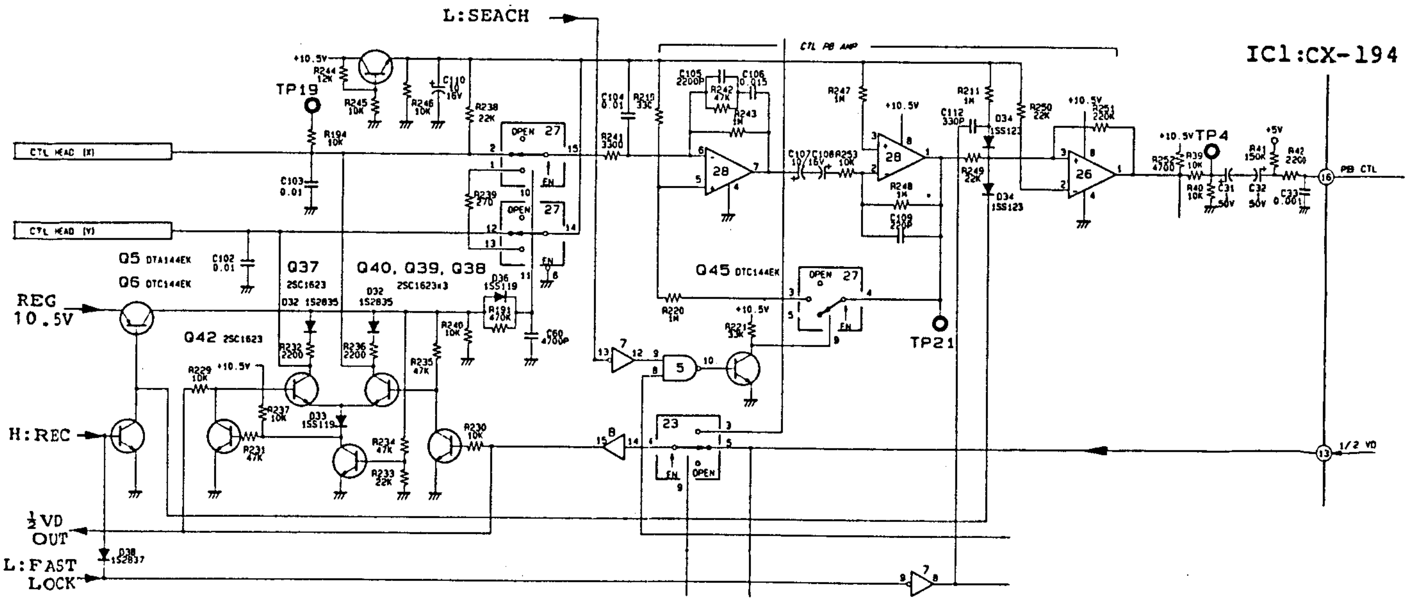
When unthreading, the H:UNTHREAD IN signal from CN13-3 turns Q30 .on, R213 is connected to R212 in parallel, and the reference voltage at pin 3 of IC15 changes from 90mV in the PLAY/REC mode to 130mV in the UNTHREADING mode. The output at pin 1 of IC15 is sent to the motor drive circuit via pin 13 and pin 14 of IC24.

6-4. CTL Circuit

6-4-1. PB CTL Circuit

The CTL signal sent from the CTL head passes switch IC27, the IC28 equalizing amplifier, and IC26, and is input to pin 16 of IC1. When recording, to protect the PB amplifier IC28, switch IC27 pulls up the PB amplifier through R239 and makes its resistor equal to the one of the CTL head.

The switch IC27 connected between pin 1 and pin 5 of IC28 reduces the gain of the amplifier IC28 to prevent the transient when the CTL head is switched to the playback mode from the record mode (when the load of the PB amplifier is switched to the head from the resistor). D34 makes pin 3 of IC26 low to speed up the response of the instant start when recording the CTL signal. Another D34 turns pin 3 of IC26 to the positive side before the instant start begins. One of the outputs at pin 1 of IC26 whose level is determined by R39 and R40, passes the ac coupling capacitor (C31 and C32), and pull-up resister R41 and the noise remover (R42 and C33), and is input to pin 16 of IC1. Other outputs at pin 1 of IC26 are sent to the reel servo via R43 and IC29, and the SY-18 board through the buffer IC8.



6-4-2. REC CTL Circuit

The REC CTL circuit consists of IC23, IC8, Q37 through Q40, and Q42. The 1/2 VD produced in IC1 CX-194 is recorded as CTL signals. The 1/2 VD output from pin 13 of IC1, passes switch IC23 and buffer IC8, and is sent to the CTL REC amplifier. Q37 and Q40 turn on and off alternately at a half cycle of the 1/2 VD and their collector output is fed to the CTL head via CN2-2.

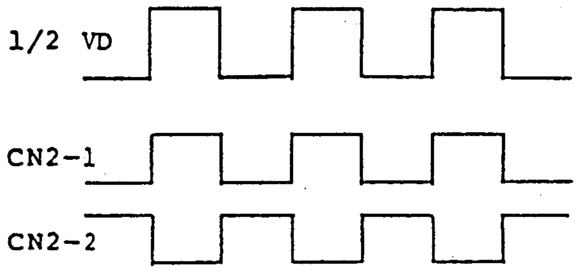
The 1/2 VD is sent to the system control circuit(SY-18 board) via CN6-2 to control the timing. When the DRUM AFC is on, the 1/2 VD shifts due to the drum speed build-up. So instead of the 1/2 VD, IC23 selects the switching pulse when the DRUM AFC is on. Q5 and Q6 switch the mode of CTL, PB or REC, and are the power source of the record amplifier.

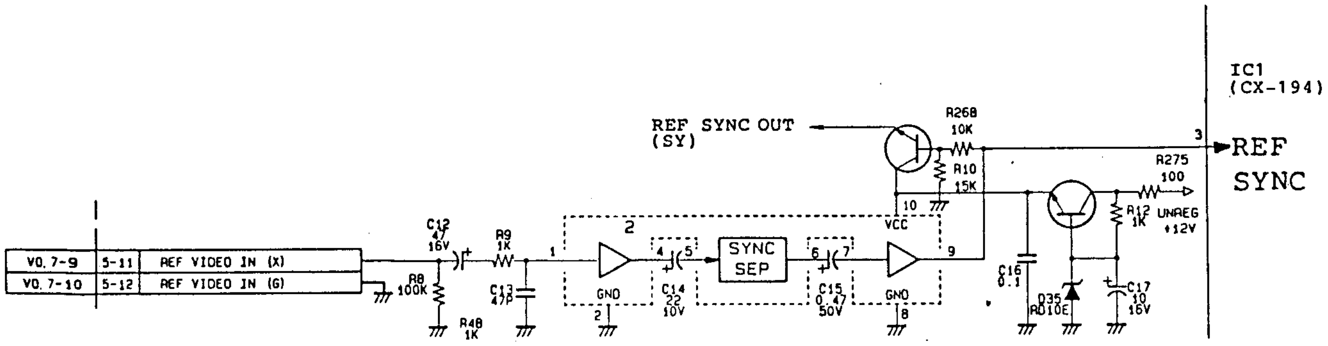
6-5. Sync Separator Circuit

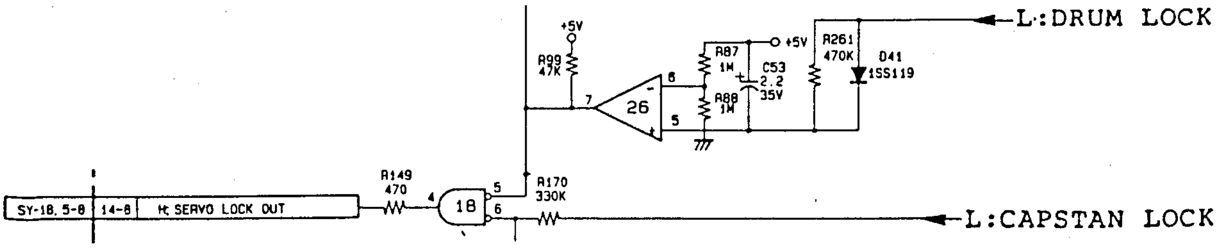
IC2 BX-3915A is employed for the SYNC SEPARATOR. Since the regulated 9V is supplied to IC2, pin 9 of IC2 always outputs the REF SYNC which is supplied to pin 3 of IC1 and the BKU-150 time code generator.

6-6. Servo Lock

The servo lock circuit consists of IC26 an IC18. When the L:DRUM LOCK and L:CAP LOCK signals sent from the IC1 CX-194 are input to IC18, the servo lock circuit outputs the H:SERVO LOCK signal which is sent to the SY-18 board. R261 and C53 delay the L:SERVO LOCK signal so that the short period of the DRUM LOCK is not accepted.







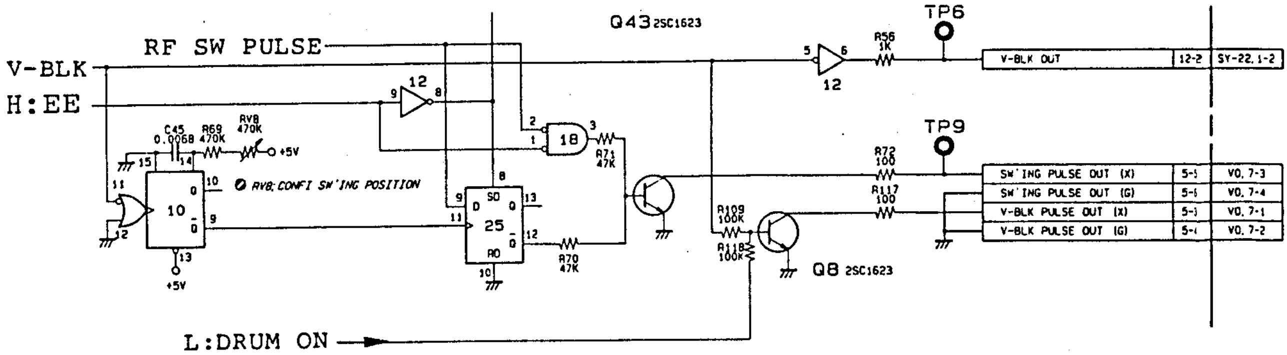
6-7. Switching Pulse Generator Circuit

Two switching pulses for the R/P head and the confidence video head are produced, and are selected according to the mode.

The V-BLK pulse input to pin 11 of IC11 is delayed and the switching position for the confidence head is determined by RV8. The delayed signal is applied to pin 10 of the D-type flip-flop IC25, and the RF SW PULSE input to pin 9 of IC25 is latched and output at pin 12. This signal is inverted by Q43 and sent to the BF-12 board via CN5-5.

When the L:EE signal is supplied to pin 8 of IC25, the CONFI SW'ING PULSE is output. Except for EE mode, pin3 of gate IC18 outputs the RF SW PULSE.

ectangular wave are opposite, the segments light


RF SW PULSE
V-BLK
H:EE
L:DRUM ON
Q43 2SC1623
Q8 2SC1623
C45 0.0068
R69 470K
RV8 470K
+5V
RV8: CONFI SW'ING POSITION
10
25
18
12
D
SD
RD
Q
R71 47K
R70 47K
R109 100K
R118 100K
R56 1K
R72 100
R117 100
TP6
TP9
V-BLK OUT 12-2 SY-22, 1-2
SW'ING PULSE OUT (X) 5-5 VO, 7-3
SW'ING PULSE OUT (G) 5-6 VO, 7-4
V-BLK PULSE OUT (X) 5-3 VO, 7-1
V-BLK PULSE OUT (G) 5-4 VO, 7-2

SECTION 7
SYSTEM CONTROL CIRCUIT (HARDWARE)

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  - 7-2-3. Jam Detection Circuit
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- 7-3. SY-22A Board
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- 7-4. SY-23A Board
- 7-5. Time Code Block
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- 7-5-2. Location of Controls
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7-1. KY-86 Board

7-1-1. LCD (Liquid Crystal Display) Driver IC1

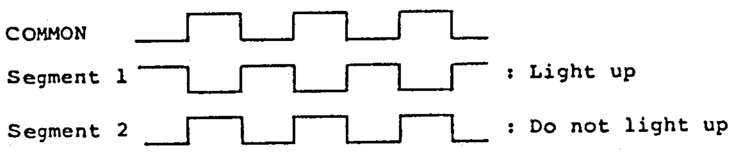
The KY-86 board has key switches, an LED display, time code Interface and an LCD counter. Microprocessor IC1 is used for the LCD display. To back up the CTL counter, IC1 has a retentive memory (RAM) which stores data. To drive seven segments of the LCD, not only the output ports of IC1, but also the port expander IC2 are used. This LCD is driven by a 64Hz rectangular wave which is supplied to pin 32 of IC1 (common terminal).

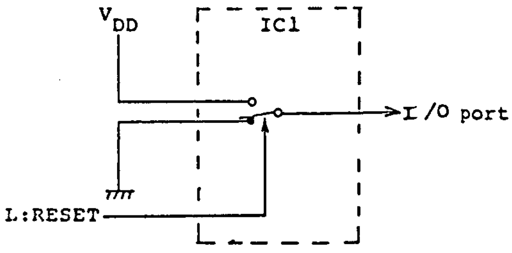
When the phase of the common terminal's rectangular wave and the phase of the segment rectangular wave are opposite, the segments light up. Therefore, if the rectangular wave is output at the common terminal, the program is in the normal routine of the LCD display.

The EVER 5V powers the IC1. Capacitor (C1 on the CN-100 board) back up the power so that the CTL/TC count is continued for about one minutes even after the power source is disconnected from BVU-150P. Wten reset, the I/O ports of IC1 output low to save power consumption.

The K ports (pin 28 to pin 31) and PH port (pin 14) of IC1 are pulled up with the resistors in IC1 so that the current flows from the EVER 5V when reset. To stop the current flow, a tri-state buffer IC4 is inserted.

When power is turned off, UN SW 5V of IC4 is cut off; the impedance of the buffer IC4 becomes high; and the current flow from the EVER 5V stops.

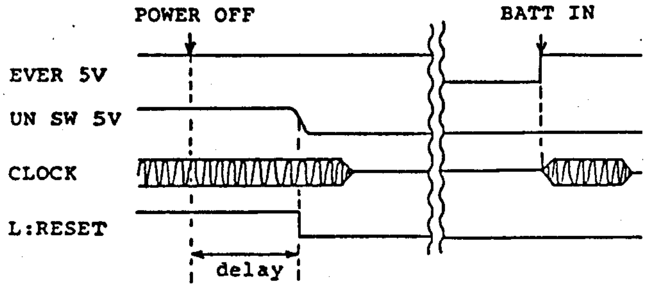


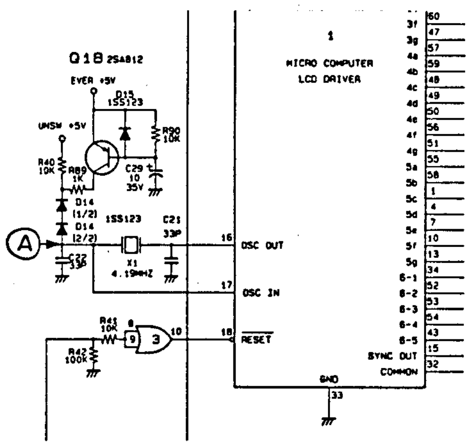


7-1-2. Clock Mute Circuit

The clock mute circuit, compsed of Q18, D14 and D15, stops the oscillator to save power when the power switch is off. When the power switch is turned off and the UNSW 5V is lost, the potential at point A drops, and the ceramic oscillator stops.

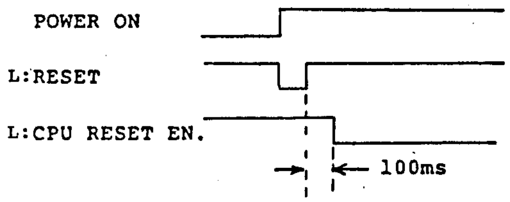
Due to the time lag between the RESET signal and the stop of the oscillator, the RESET signal must be reset before the oscillator stops. When a battery is inserted when the power switch is off, a random character or number will be displayed. To avoid this, Q18 temporarily generates a clock and the microprocessor is reset.





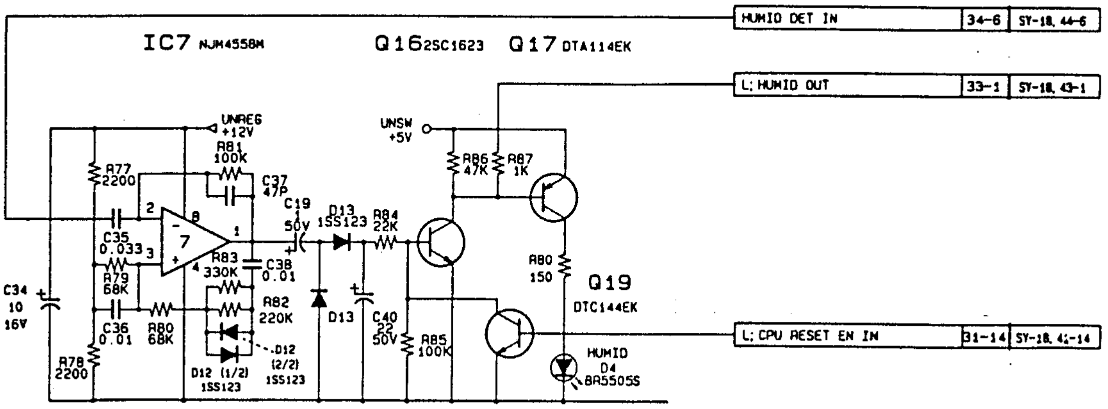
7-1-3. LED Drive Circuit

The LED circuit consists of Ql, Q2 and Q6 through Q15. Ql and Q2, controlled by the CPU RESET EN signal, are the switches of the LED drive circuit. They are controlled by CPU RESET EN signal because the LED's liht. up when the power switch is turned on due to the lack of the expanded ports. Power is supplied to the LED drive circuit 100mS after the L:RESET signal.



7-1-4. DEW Detection Circuit

The DEW detection circuit consists of IC7 and Q16 through Q19. IC7 is a Wien bridge oscillator, which oscillates due to the change in resistance caused by dew. The output of the oscillator is rectified, turns on Q16 and Q17, and lights up D4. This circuit is also controlled by the CPU RESET EN signal.



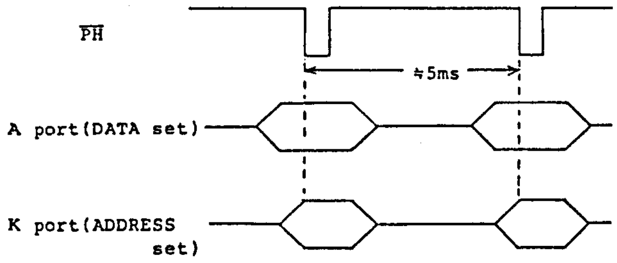
7-1-5. KY-microprocessor Display on the LCD

To light up the segments of the LCD, the KY microprocessor IC1 on the KY-86 board processes signals as follows.

LCD data is sent to A0 through A3 from the main microprocessor IC1 on the SY-18 board.

The LCD address is send to K0 through K3 from the IC1 on the SY-18 board.

The KY-microprocessor IC1 on the KY-86 board can accept the LCD data (A0 through A3) and the LCD address at the timing of L:PH signal (H latched). If the PH signal is input to the KY-microprocessor, the KY-microprocessor is considered to be in the display routine.



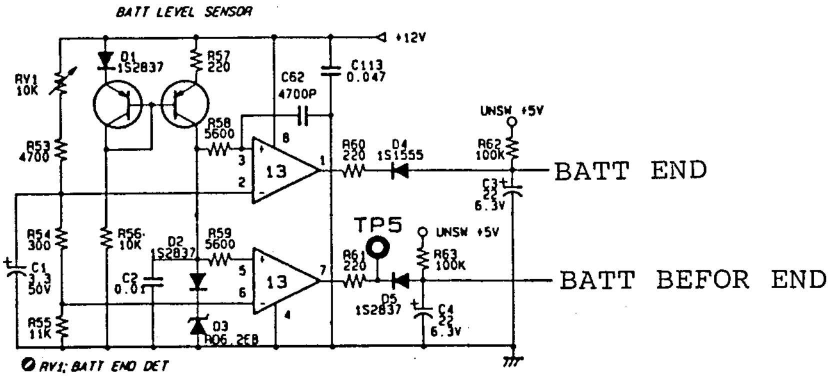
7-2. SY-18 Board

Using two microprocessors, the SY-18 board performs the main work of the system control. The IC1 (master) receives information from external inputs such as the eight input keys, the remote control inputs and mechanism switches. The IC2 (slave) communicates data from the IC1 and sends instructions to the function block. IC3 through IC6 are the input port-expanders for IC1.

7-2-1. Battery Level Sensor Circuit

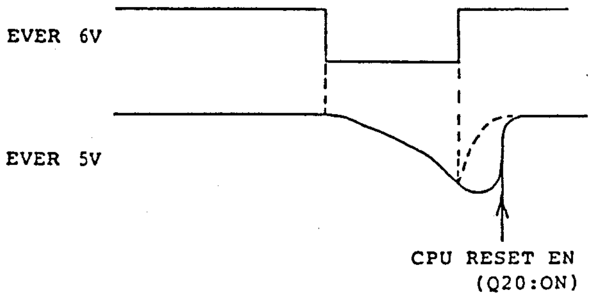
The battery level sensor circuit consists of Q1, Q2 and IC13. Q1, Q2, D1, D2 and D3 form the temperature-compensated constant current circuit which supplies the reference voltage to the positive input of OP amplifier IC13. The BATT END signal is output at pin 1 of IC13. The BATT BEFORE END signal is output at pin 1 of IC13. These detection signals are delayed two seconds by the integral circuit (resistor 100k ohm and capacitro 22uF) to prevent misdetection of battery failure due to fluctuation of the battery voltage when the power switch is turned off.

The detection level of the live battery is adjusted by RV1. Adjust RV1 so that approximately 11.28V of the battery voltage at TP13 on the PSB-4 board is detected and so that the level at TP5 goes from low to high.



7-2-2. EVER 5V Detection Circuit

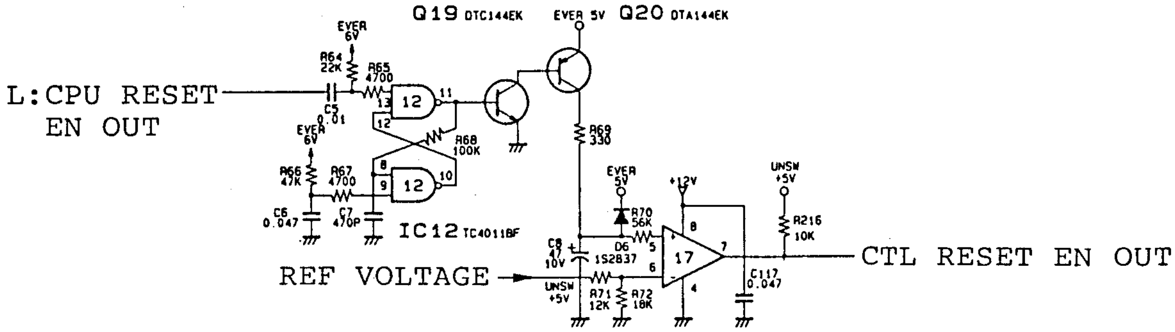
The EVER 5V detection circuit is composed of Q19, Q20, IC12 and IC17. The power source of IC1 (KY microprocessor) on the KY board is the EVER 5V. When the battery is disconnected, the EVER 5V gradually decreases. When the battery is connected again, the EVER 5V is more than 4V and the CTL counter can continue counting since data is still held in the RAM. If not, the CTL counter has to be reset. IC17 detects whether the EVER 5V is 4V or not. If the EVER 5V is less than 4V when the battery is connected, the IC1 is first reset; Q20 is turned on by the CPU RESET EN signal.

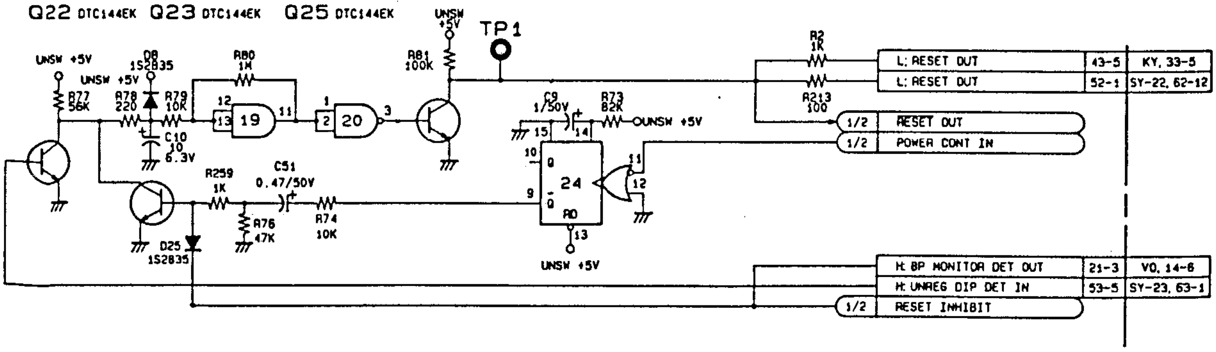


7-2-3. Jam Detection Circuit

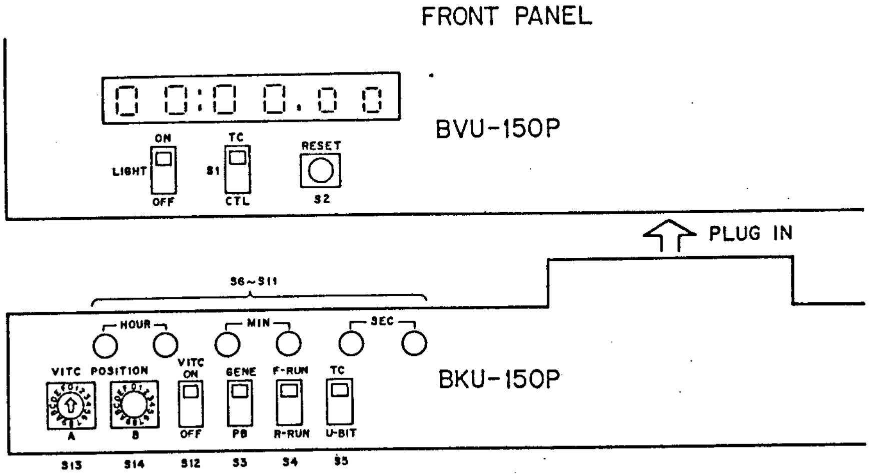
IC1 and IC2, which transfer serial data, are jammed when data is lost. In order to detect jamming, the serial data fed to pin 46 of the IC1 microprocessor, is input to the clock input of IC24. When detected, pin 9 of IC24 goes high, Q23 turns on, and the microprocessors are reset.

When power is disrupted as when connecting the XLR connector when the battery is operating all of the plungers are disengaged to protect the tape during the temporary blackout. The micro processors work normally, but finally misjudge the tape slack since the power of the microprocessors is not affected. To avoid this misoperation, Q22 forcibly resets the microprocessors. If the UNREG 12V drops less than 7V, the H:UNREG DIP DET IN signal is supplied to Q22.





7-5-2. Location of Controls



(1) Time Code Function

Mode \ Switches		S1 TT/TC	S3 GEN/ PB	S4 F-RUN/ R-RUN	S5 TC/ U-BIT	EXT TC IN	Remarks
CTL Display		TT	-	-	-	-	
Time code dis-play	F-RUN	TC	GEN	F-RUN	TC	X	
		TC	PB	F-RUN	TC	-	
	R-RUN	TC	-	R-RUN	TC	-	
	SLAVE LOCK	TC	GEN	F-RUN	TC/ U-BIT	O	The generator is slave-locked to the external LTC.
	DATA ENTRY	TC	GEN	R-RUN	TC/ U-BIT	-	Press S6 to S11 (hour, min, sec).
	DATA RESET	TC	GEN	R-RUN	TC/ U-BIT	-	Press S2 (reset).
	PLAYBACK	TC	PB	-	TC/ U-BIT	-	VTR is in the PB mode.

TT: Tape time

TC: Time code

(2) Display Information

S3 GEN/PB \ Mode		REC	EE	STOP	FWD	FWD PAUSE	FF/ REW
GEN	——	Generated time code	←	←	←	←	←
PB	TC EXIST	↑	←	Hold	Played back time code	Hold	Hold
	* $\overline{\text{TC EXIST}}$	↑	←	Hold	Hold	Hold	Hold

* $\overline{\text{TC EXIST}}$; No time code exists.

(3) VITC Function

Function \ Switches	S12 VITC ON/OFF	S13 VITC S14 position	Remarks
VITC MIX	ON	Preset S13 and S14.	Preset VITC positions A and B respectively. (NTSC: 10 - 25H PAL : 7 - 22H)
VITC OFF	OFF	-	-

7-5-3. KY-86 Board Time Code Block

4-bit CTL data (TT DATAs 0 through 3) and CTL addresses (ADDRESSes 0 through 2) are fed from a main microcomputer on the SY-18 board to display microcomputer IC1 on the KY-86 board. Time code data (TC DATA 0 through 3) and time code addresses (TC DIGITs 0 through 3) are fed from the BKU-150P to display microcomputer IC1.

A 1/2 VD signal for the time code signal is generated by the BKU-150P and is sent to a main microcomputer on the SY-18 board. The microcomputer executes display processing by using this 1/2 VD signal. However, the display microcomputer is unable to handle operartions whereby an LCD display is executed for every frame. Consequently an LCD display is executed every two frames. In other words, one frame is designated for writing into RAM IC10 and the other frame for display. When an H: TC WRITE ENABLE signal is high, data is written into RAM IC10 during one frame period. When the signal is low, the data is read from RAM and display processing is performed.

When DISPLAY DATA CTL/TC signal from connector CN33-10 is low and the H: TC WRITE ENABLE signal is high, "L" appears at pin 11 of IC5. This signal enables IC9 and IC11 buffer operation. As a result, data and addresses are written into RAM IC10.

When the H: TC WRITE ENABLE signal is low, the output impedance of IC9 and IC11 goes high and data from IC10 is read into display microcomputer IC1.

IC8 is used to control addresses. S0 through S5 are open when the H: TC WRITE enable signal is high. At this time, IC8 does not influence the TC digit pulses.

In the read mode, 6-bit read address signals are generated from 3-bit address signals A, B and C in IC8 which are fed from system control.

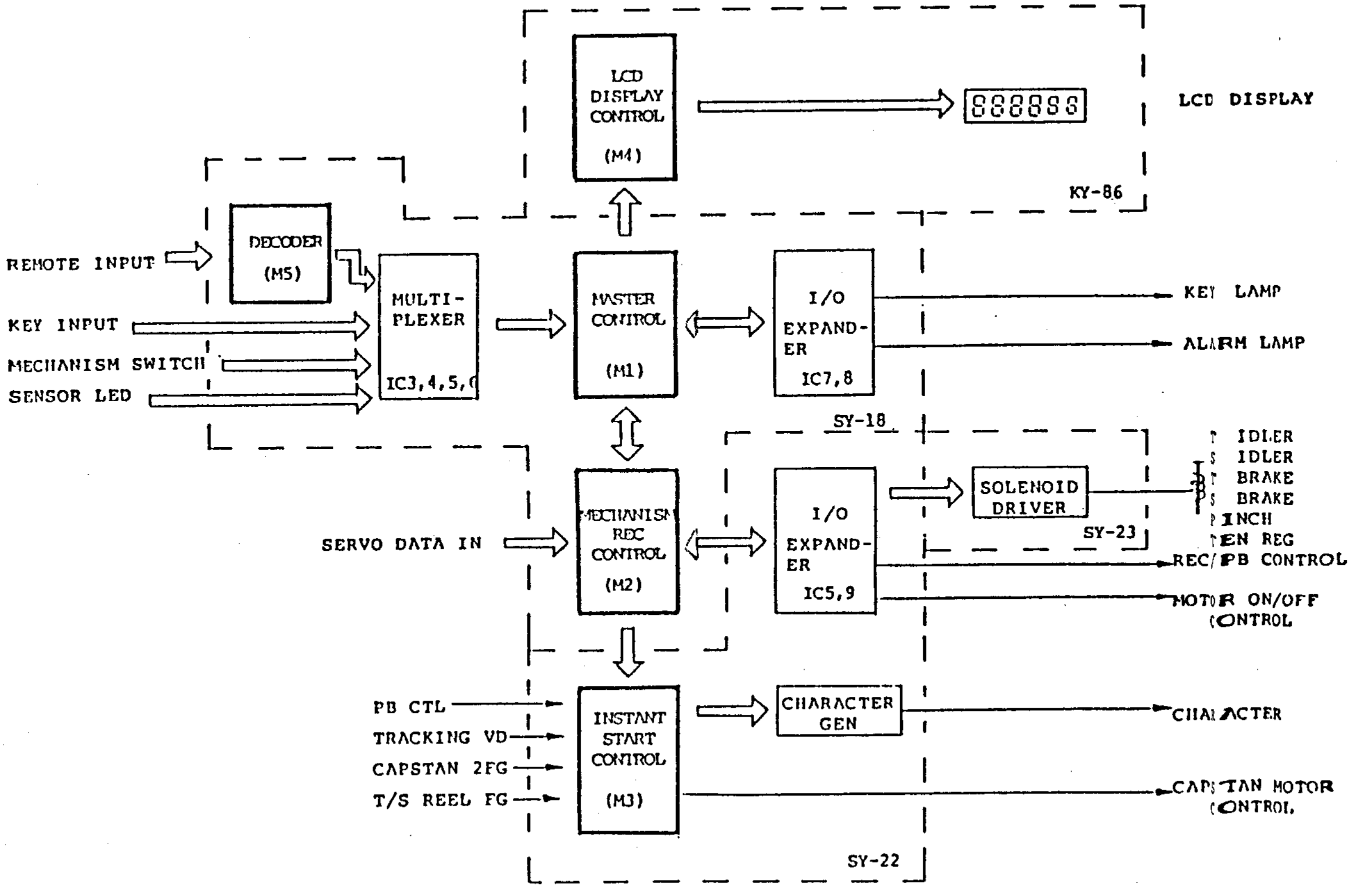
SECTION 8
SYSTEM CONTROL CIRCUIT (SOFTWARE)

Outline

Microcomputers Ml through M5

The BVU-150 is a portable videocassette recorder of which components are packed at a high density. The BVU-150 consists of five one-chip microcomputers, each containing a memory and I/O ports. These five one-chip microcomputers have the following functions.

1. IC1/SY-18 : Matter microcomputer for system control circuit; Microcomputer M1
2. IC2/SY-18 : Controls record timing and mechanism for system control; Microcomputer M2
3. IC2/SY-22 : Controls quick starting of capstan motor; Microcomputer M3
4. IC1/KY-86 : Controls tape count and time code LCD on the front panel; Microcomputer M4
5. IC9/SY-18 : Decodes remote control signal;Microcomputer M5



1. Microcomputer M1 (IC1/SY-18)

Microcomputers M1 and M2 play an important role in the system control circuit. Microcomputer M1 processes input signals, i.e., processes data input from the front panel, executes operational instructions specifying remote control, or acquires the status of the machine from the mechanism switches and sensors. Microcomputer M1 also instructs the system controller to operate.

The signals output as a result of the execution of an instruction are used to light the keys on the front panel, and to generate such warning signals as: SERVO LOCK, HUMID, SLACK, TAPE END, and BATTERY END. (See the previous illustration.)

The key and warning signals are output through their respective extension ports. The input section contains four multiplexers to extend the number of input ports.

2. Microcomputer M2 (IC2/SY-18)

Microcomputer M2 operates as a slave unit for microcomputer M1. Microcomputer M2 accepts parallel data such as SERVO DATA to monitor different modes, and it outputs the mechanism control signals which turn the motor, solenoid, and the REC timing control signal on and off.

Microcomputer M2 has two extension output ports which are used for interfacing with the system control unit and REC system control. Microcomputer M1 communicates serially with microcomputer M2 via three communication lines. To check if microcomputers M1 and M2 are satisfactorily operating, all that needs to be done is to check the condition of these communication lines.

3. Microcomputer M3 (IC2/SY-22)

Microcomputer M3 compares the VD pulse with the PB CTL pulse in order to start the capstan motor quickly.

The VD pulse is compared with the PB CTL pulse in a conventional phase servo circuit at every vertical period. The VD pulse is compared with the PB CTL pulse by microcomputer M3 to lock the capstan phase servo quickly at the capstan 2FG period.

In this way, the PB CTL signal is pulled in phase into the VD signal within a very short period of time.

Microcomputer M3 calculates the amount of unused tape on the supply reel. Calculations are based on the S-REEL MOTOR FG signal being input so that IC4 on the SY-22 board generates a character indicating the remaining tape amount.

4. Microcomputer M4 (IC1/KY-86)

Microcomputer M4 controls the liquid crystal display (LCD) on the front panel. Switch S1 on the SY-22 board selects either the real time tape count/time code or the six-digit diagnostic data. The LCD displays on the front panel are controlled by microcomputer M1.

5. Microcomputer M5 (IC9/SY-18)

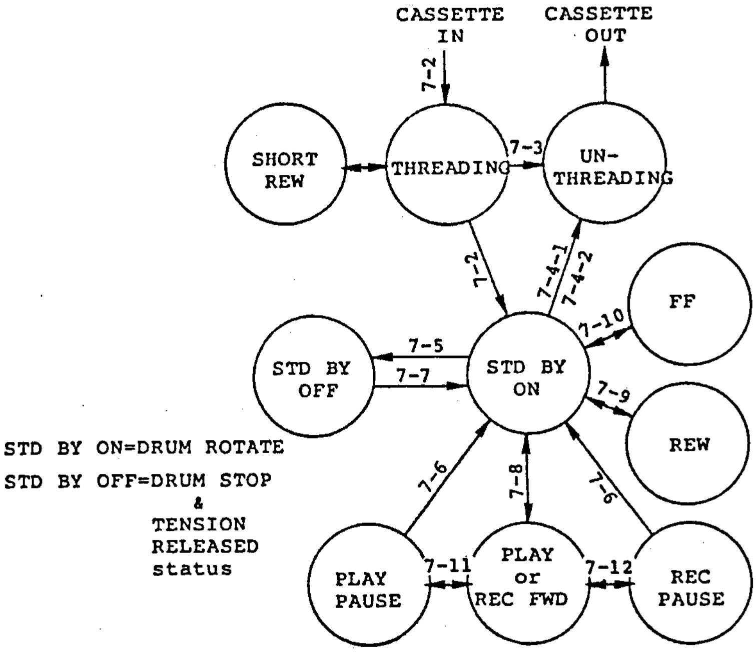
Microcomputer M5 is a four-bit microcomputer which decodes instructions given in the serial format from the remote controller and which outputs a parallel signal to microcomputer M1.

3. DIAGNOSIS IN BVU-150 MECHANISM

The mechanical parts of the BVU-150 use ten available modes. Mode changes are carried out as indicated by the arows in the illustration.

For example, if the PLAY button is pressed after a cassette is inserted to the cassette compertment, the mode changes as follows from CASSETTE-IN, THREADING, STD BY ON, to PLAY. If the EJECT button is pressed during the PLAY mode, the mode changes from PLAY, STD BY ON UNTHREADING, to CASSETTE OUT.

If there is a problem in the mechanical parts, the defective mode is checked before it is allowed to change. Troubleshooting is carried out by the diagnostic functions in reference to the specific ID numbers on the timing chart.



(The numbers in the illustration indicate the corresponding timing charts which will be described later.)

Fig. 8-1 Transition of mechanism mode.

4. USING THE TIMING CHARTS

The timing charts for ID numbers 7-2 through 7-12 are prepared for each mode shown in Fig. 8-1. The use of the respective timing charts will be described by referring to ID number 7-2 indicating mode change CASSETTE IN, (THREADING), STD BY ON as an example.

4-1. Signals

There are two types of signals: INPUT signals which are fed to microcomputers M1 and M2, and OUTPUT signals which are fed from these microcomputers.

The timing chart for ID number 7-2 lists six INPUT signals and 12 OUTPUT signals.

4-2. Measuring Points

The measuring points indicate the IC terminals on which signals can be monitored. For instance, the CASSETTE IN signal in the first column of the timing chart can be observed at pin 4 of IC3 on the SY-18 board.

4-3. Label Number for Self-diagnosis

When switch S1 on the SY-22 board is on, the machine automatically switches to the diagnosis function. The LCD on the front panel switches from a four-digit tape count to six-digit diagnostic data.

TIMING CHART
2-2. CASSETTE IN-(THREADING)-STOP

	SIGNAL	MEASURING POINT		LABEL NO. ON SELF-DIAGNOSTICS	CASSETTE INSERTION
IN	CASSETTE IN	L; CASSETTE IN	SY-18 IC3-4	20-4	
	CASSETTE LOCK	L; CASSETTE LOCK	SY-18 IC4-4	20-3	
	UNTHREAD END	L; UNTHREAD END	SY-18 IC6-4	20-1	
	THREAD END	L; THREAD END	SY-18 IC5-4	20-2	"H"
	EJECT SW	L; EJECT SW ON	SY-18 IC3-3	1 -4	"H"
	TAPE END	L; TAPE END	SY-18 IC6-5	21-1	"H"
OUT	DRUM ON	L; DRUM ON	SY-22 IC9-16	05-1	
	S - BRAKE ON	H; S - BRAKE ON (*1)	SY-22 IC9-23	04-3	
	THREAD MOTOR ON	H; THREAD MOTOR ON	SY-22 IC9-2	03-4	
	CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY-22 IC5-17	02-1	
	FWD / $\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY-18 IC2-2	06-1	"H"
	TENREG. SOLENOID ON	H; TENREG. SOL. ON	SY-22 IC9-1	04-4	"L"
	T - BRAKE ON	H; T-BRAKE ON (*1)	SY-22 IC9-5	03-1	"L"
	PINCH SOLENOID ON	H; PINCH SOL. ON	SY-22 IC9-4	03-2	"L"
	UNTHREAD MOTOR ON	H; UNTHREAD MOTOR ON	SY-22 IC9-3	03-3	"L"
	SEARCH	L; SEARCH	SY-18 IC2-1	06-2	
	CAPSTAN SPEED 0		SY-18 IC2-7	08-3	
	CAPSTAN SPEED 1		SY-18 IC2-8	08-4	"H"

6. APPLICATIONS OF DIAGNOSIS

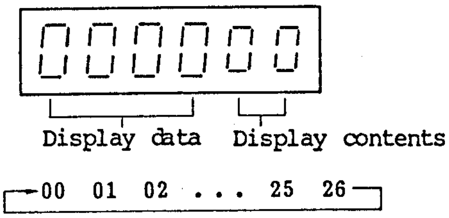
Assume that the supply brake cannot be applied and that consequently threading cannot be completed. To determine why this had happened, follow the procedure described below. (Note: Tape is fed from the supply reel during threading.)

Preparation

(1) Turn on the power switch, and check if power supplies UNSW 5V, REG 5V, and EVER 5V are satisfactorily working.

(2) Set switch S1 on the SY-22 board at ON to switch to the diagnosis mode. The LCD on the front panel will then display a six-digit number whose right two digits indicate the display contents "00".

(3) Check if the number indicated on the display contents is incremented by one each time the RESET button on the front panel is pressed.



Diagnosis

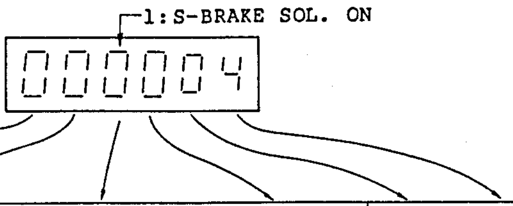
(4) Repeatedly press the RESET button until 04 is displayed in the display contents column of the LCD.

The third digit from the left on the display data indicates the S-BRAKE ON signal (identified by 04-3), and should be 0 at this time.

Notes:

1 = BRAKE SOL. ON = Brake is released.

0 = BRAKE SOL. OFF = Brake is applied.

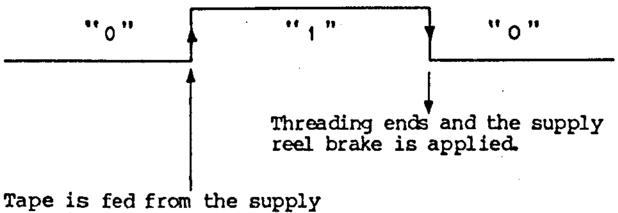


	FIGURES OF DISPLAY				LABEL	
	1	2	3	4	5	6
IC2/SY-18 OUTPUT DATA	$\overline{\text{VIDEO MUTE}}$ "0" (SY-22 / IC5-5)	AUDIO MUTE "1" (SY-22 / IC5-4)	AUDIO CH-2 $\overline{\text{PB}}$/EE "0/1" (SY-22 / IC5-3)	AUDIO CH-1 $\overline{\text{PB}}$/EE "0/1" (SY-22 / IC5-2)	0	0
		VIDEO PB/$\overline{\text{EE}}$ "1/0" (SY-22 / IC5-22)	$\overline{\text{AUDIO CH-2 REC}}$ "0" (SY-22 / IC5-23)	$\overline{\text{AUDIO CH-1 REC}}$ "0" (SY-22 / IC5-1)	0	1
	$\overline{\text{CAPSTAN MOTOR ON}}$ "0" (SY-22 / IC5-17)		$\overline{\text{VIDEO CH-B REC}}$ "0" (SY-22 / IC5-19)	$\overline{\text{VIDEO CH-A REC}}$ "0" (SY-22 / IC5-20)	0	2
	T-BRAKE SOL. ON (*NOTE-1) "1" (SY-22 / IC9-5)	PINCH SOL. ON "1" (SY-22 / IC9-4)	UNTHREAD MOTOR ON "1" (SY-22 / IC9-3)	THREAD MOTOR ON "1" (SY-22 / IC9-2)	0	3
	S-IDLER SOL. ON "1" (SY-22 / IC9-21)	T-IDLER SOL. ON "1" (SY-22 / IC9-22)	S-BRAKE SOL. ON (*NOTE-2) "1" (SY-22 / IC9-23)	TENREG. SOL. ON "1" (SY-22 / IC9-1)	0	4
	$\overline{\text{DRUM ON}}$ "0" (SY-22 / IC9-16)	DRUM AFC ON "1" (SY-22 / IC9-15)			0	5
	FWD/$\overline{\text{REV}}$ COMMAND "1" (SY-18 / IC2-2)	$\overline{\text{SEARCH}}$ "0" (SY-18 / IC2-1)		$\overline{\text{IC2 READY}}$ "0" (SY-18 / IC2-47)	0	6
		TEST INT OUT "1" (SY-18 / IC2-5)	$\overline{\text{PB}}$ (*NOTE-3) "0" (SY-18 / IC2-4)		0	7
			CAPSTAN SPEED 1 (*NOTE-13) (SY-18 / IC2-8)	CAPSTAN SPEED 0 (*NOTE-13) (SY-18 / IC2-7)	0	8

(5) Load the cassette tape and start threading. Check if the number representing the S-BRAKE ON signal identified by "04-3" changes from 0 - 1 - 0 while the S-BRAKE ON signal is being fed. (See the timing chart.)

Note:
0 = Brake is applied.
1 = Brake is released.

If the display data changes accordingly when the brake cannot be applied, the circuit blocks following ID number 5 are defective and should be checked.



Threading ends and the supply reel brake is applied.

Tape is fed from the supply reel during threading.
(The supply reel brake is released.)

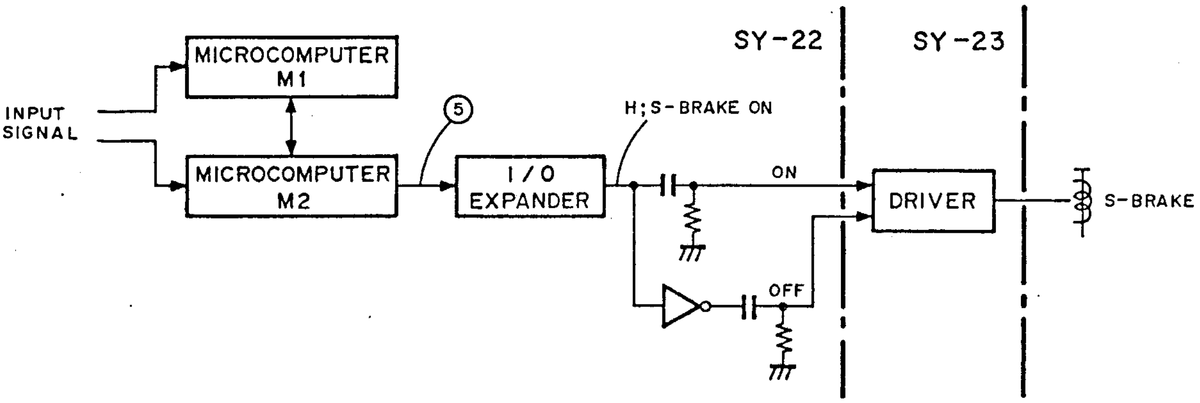
(6) If the 3rd digit of the LCD remains "1" after changing from "0" to "1", the brake cannot be applied.
The circuit blocks preceding ID number 5, including microcomputers M1 and M2 and/or any related signal lines are then defective.
Check if the following six-signal conditions are satisfied.

These six signals are fed to the microcomputers specified by IN in the timing chart during threading.
(See the timing chart.)

L:CASSETTE IN = "1" → "0"
L:CASSETTE LOCK = "0" → "1" → "0"
L:THREAD END = "1" → "0"
L:UNTHREAD END = "0" → "1"
L:EJECT SW = "1"
H:TAPE END = "1"

If the above six-signal conditions are not satisfied, check the corresponding signal lines and switches.
If the above six-signal conditions are satisfied, check the following.

- Connection of the S-BRAKE ON signal line
- Microcomputers M1 and M2/SY-18 or IC9/SY-22



9. MUTING CONDITION

There are three muting conditions.

1. MUTING 1

Muting is done when the mode changes from PB to EE or vice versa.

PB to EE = 2.2sec (NTSC)
= 2.6sec (PAL)
EE to PB = 1.3sec (NTSC)
1.9sec (PAL)

2. MUTING 2

In the FF, REW or FWD (except PAUSE)mode, the drop of CTL is checked after 495msec(NTSC) or 600msec(PAL).

If the CTL signal is not detected during 47msec (NTSC/PAL), MUTING 2 is done.

3. MUTING 3

When no picture is displayed.

In the FF, REW or FWD (except the EJECT and the STANDBY OFF) modes, muting is released one second after the mode transition finishes with the tape threaded.

Muting 3 is done with the exception of above conditions.

10. TAPE REMAIN DISPLAY

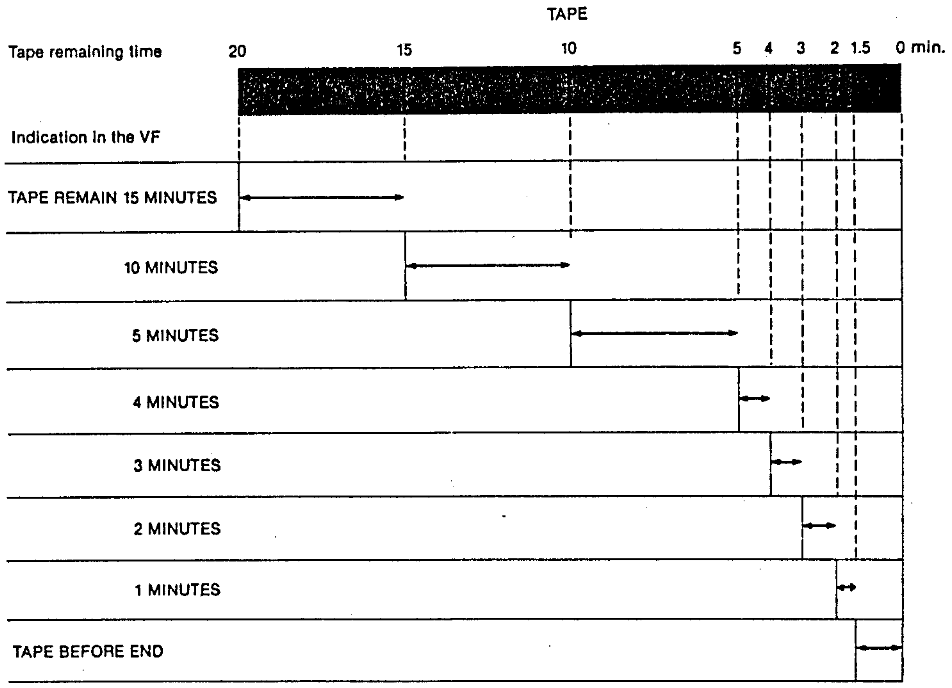
The display of the tape remaining is as shown in the table.

To judge whether the threaded tape is KCS-20 (20min.) or KCS-10 (10min.), FG of T-reel and S-reel are used for detection.

TAPE REMAINING TIME		DISPLAY
KCS-20	KCS-10	
More than 15 min.	-	TAPE REMAIN 15 MIN
10 to 15 min.	-	TAPE REMAIN 10 MIN
5 to 10 min.	More than 5 min.	TAPE REMAIN 5 MIN
4 to 5 min.	4 to 5 min.	TAPE REMAIN 4 MIN
3 to 4 min.	3 to 4	TAPE REMAIN 3 MIN
2 to 3 min.	2 to 3	TAPE REMAIN 2 MIN
1.5 to 2 min.	1.5 to 2	TAPE REMAIN 1 MIN
Less than 1.5 min.	Less than 1.5 min.	TAPE BEFORE END

Note : When the return video button is pressed, the display appears on the viewfinder.

Note : Even if the tape remain time is 18 minutes, the display reads 15 minutes.



* The indication disappears at the tape end.

11. TAPE PROTECTION

When tape slack is detected, the slack function protects the tape. The table shows the detection mode and cause of slack.

(Note: The time in the table shows the detection delay.)

REEL STOP :

When the REEL STOP is detected after the detection delay and when the REEL STOP is not detected in two seconds during braking(stop mode), tape is slack.

DRUM ROTATE :

2 second delay of DRUM ROTATE detection. When the DRUM ROTATE signal DROPS after two seconds, the tape is slack.

TEN-REG SW :

In the STANDBY OFF mode, during the release of tape tension, the TEN-REG SW signal does not go to low after lasting approximately 700msec the tape is slack.

TAPE PROTECTION :

When the capstan reverse status continues for 5 seconds, this signal goes high. The pinch roller is disengaged and the tape is slack.

TABLE

SLACKING / DETECTION MODE	REEL STOP		DRUM ROTATE	TENREG SW	TAPE PROTECTION
	T	S			
THREAD			O 2 sec		
S-UNTHREAD		O 0.8 sec	O 2 sec		
T-UNTHREAD	O 0.8 sec				
FF	O 3.6 sec		O 2 sec		
REW		O 3.6 sec	O 2 sec		
FWD	O 1.2 sec		O 2 sec		O 5 sec
STDBY ON STOP			O 2 sec		
STDBY OFF STOP				O 0.7 sec	O 5 sec
FWD*PAUSE			O 2 sec		
REC*FWD*PAUSE			O 2 sec		O 5 sec
SHORT REW		O 2.4 sec	O 2 sec		
BRAKE	O 2 sec	O 2 sec	O 2 sec		

SECTION 9

MEASURING EQUIPMENT, JIGS, AND TOOLS

Perform troubleshooting, repair, and adjustments using the followingmeasuring equipment and service tools.

Measuring Equipment

- Color monitor
- Dual trace oscilloscope
- Signal generator SONY-TEKTRONIX 1411
- Vectorscope SONY-TEKTRONIX 521A
- Spectrum analyzer
- Frequency counter
- dc voltmeter
- Audio oscillator
- VTVM
- Camera adaptor (AC-500CE)
- Current probe

Others	Remarks
*Filter	Kodak wratten gelatin filter No.96 N.D. 2.00 and No.96 N.D. 0.60
*Blank tape	KCS-20 and KSP-S20 (Sony standard product)

*Local specially-made cassette tape for the playback tension adjustment
(Refer to the service manual)

*Local specially-made connector for tape path adjustment
(Refer to the service manual)

Fixture	Parts NO.
Drum eccentricity gauge (3)	J-6001-820-A
Drum eccentricity gauge (2)	J-6001-830-A
Drum eccentricity gauge (1)	J-6001-840-A
Drum eccentricity gauge (4)	J-6001-930-A
Reel table torque measurement tape (40 mm dia)	J-6002-270-A
Flatness plate	J-6009-830-A
Dihedral adjusting screw	J-6080-013-A
Small mirror for adjustment	J-6080-029-A
Spare mirror	J-6080-030-A
Reel table height check base jig	J-6130-010-A
Reel table height check jig	J-6130-020-A
Clearance check gauge	J-6152-450-A
Tape guide slantness check tool	J-6152-560-A
RV adjustment driver	J-6026-240-A
Cleaning fluid	Y-2031-001-0
Cleaning piece	2-034-697-00
Eccentric screwdriver (4 mm dia.)	3-702-390-01
Tension scale (50 g full scale)	7-732-050-20
Tension scale (100 g full scale)	7-732-050-30
Tension scale (500 g full scale)	7-732-050-50
Alignment tape, RR5-2SB-PAL	8-960-020-62
Alignment tape, RR2-1SD-PAL	8-960-036-02
SP Alignment tape, RR5-1SD-PAL	9-960-036-80
Thickness gauge	9-911-053-00
L-shaped hexagonal wrench	7-700-736-00

BVU-150P (EK)
3-694-769-03

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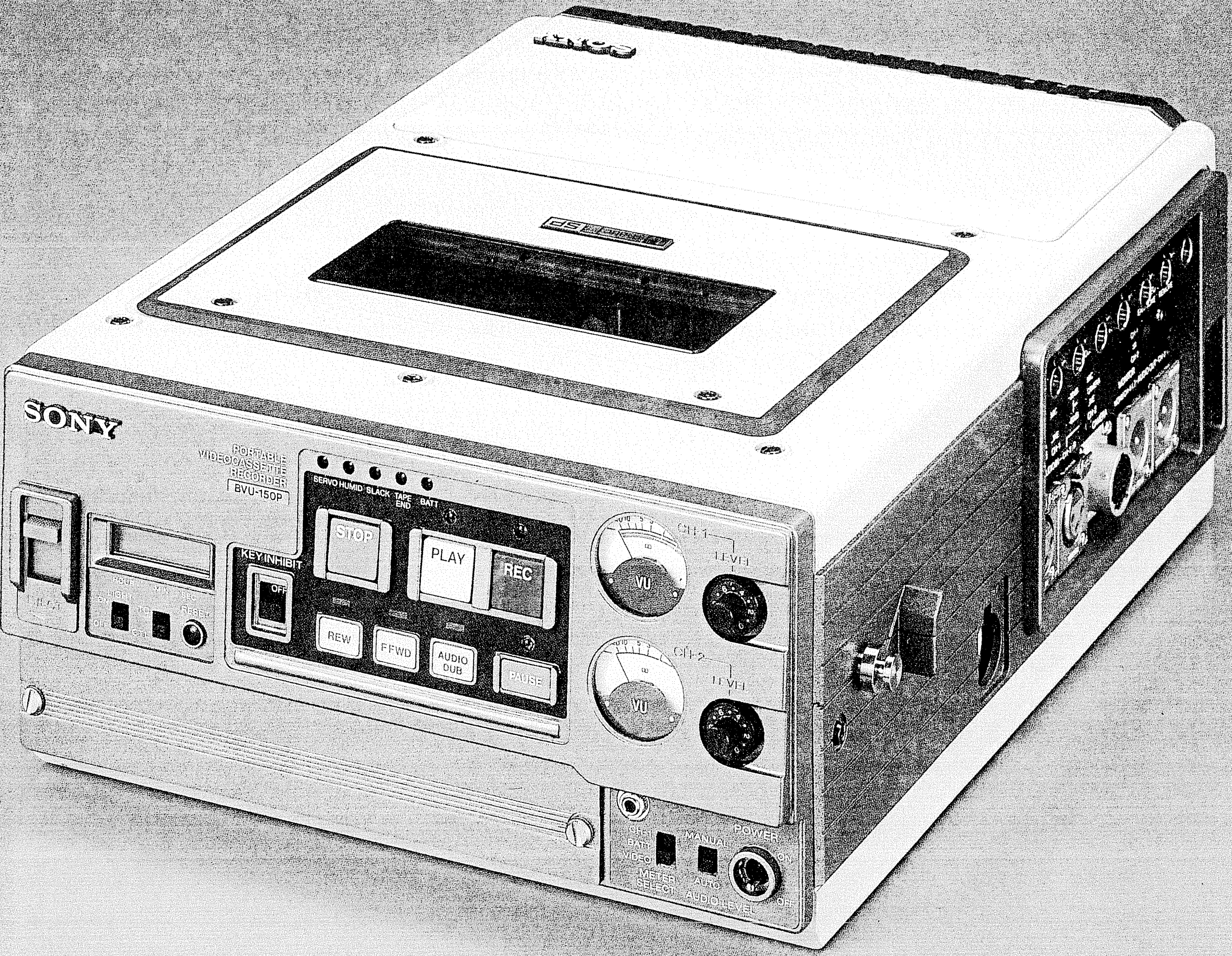
1985. 9 11

U-matic S SP

Portable U-matic SP Videocassette Recorder

BVU-150P

(PAL)



Sony Broadcast

SONY®

The Superior Performance Portable Videocassette Record

The BVU-150P is a Superior Performance (SP) U-matic Videocassette recorder. Retaining all the features and functions of the BVU-110P, it is more compact and lighter in weight than previous models, and offers much improved video and audio performance. This has been made possible by the adoption of Superior Performance (SP) circuit, type C Dolby Noise Reduction System, and the inclusion of advanced technology into the conventional circuits.*

Although the BVU-150P requires the use of the new SP videocassette tape for recording and playback in SP mode, complete interchangeability between SP videocassette tape and the conventional videocassette tape is maintained.

The BVU-150P brings a new standard of excellence to broadcast U-matic equipment.

VIDEO SYSTEM

High Picture Quality

The BVU-150P employs newly designed Superior Performance (SP) circuits with the conventional circuits and includes an improved Y/C separator. As a result, significant improvement in picture quality has been achieved.

New Tape

The new SP videocassette tapes, having a higher frequency response, have been specially developed for use with the BVU-150P in SP mode. SP mode can only be activated when an SP cassette is inserted. However, both SP and conventional videocassette tapes can be used for recording and playback on both SP and conventional U-matic recorders.

Video Confidence Playback

For the first time in portable BVU U-matic recorders, video confidence heads are included enabling simultaneous playback of material being recorded.

Full Colour Playback

High quality colour playback is available without any external equipment.

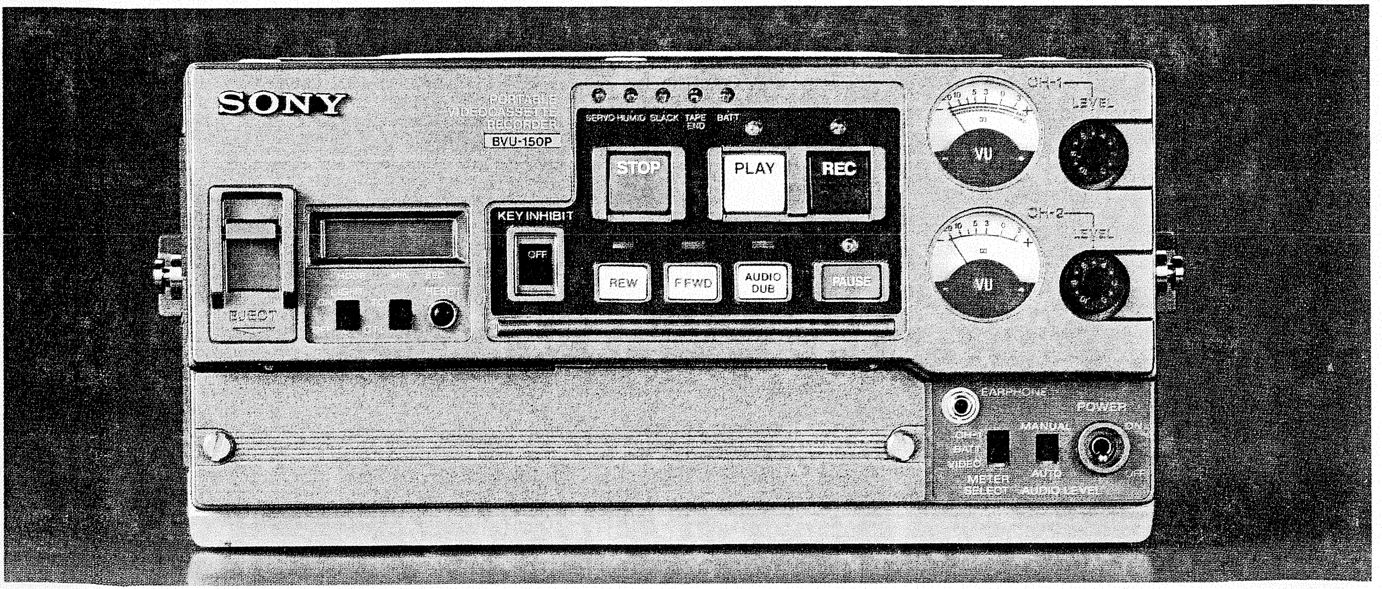
AUDIO SYSTEM

High Audio Quality

The adoption of a new Sendust head block and the inclusion of the type C Dolby Noise Reduction System have allowed considerable improvement in audio quality, particularly in S/N ratio.

Automatic/manual Recording Level Control

Audio recording levels may be selected to be under automatic or manual control. For manual operation, independent level controls are provided for Audio 1 and Audio 2 inputs. In addition, each audio input has a Line/Mic level and impedance selector switch. A jack socket is provided for monitoring purposes with an Audio 1/Audio 2/Mix selector.



OTHER FEATURES

Lightweight and Rugged Design

The use of a magnesium diecast alloy frame contributes to considerable saving in weight and also provides very rugged construction.

Backspace Editing Capability

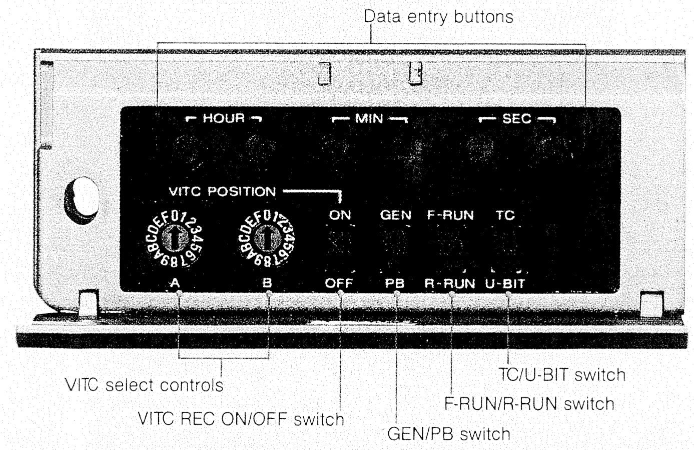
The automatic backspace editing facility allows sequential recording without picture breakup at transition points.

Rapid Point Location

To facilitate rapid edit point or tape segment location, recognisable pictures can be viewed up to 10 times normal speed in either forward or reverse directions.

Integral Time Code Generator BKU-150P (Optional)

A plug-in Time Code Generator BKU-150P can be accomodated within the machine. A switch on the BKU-150P allows either Rec Run or Free Run to be selected. LTC, VITC and user bits can be preset by front panel controls. The front panel LCD display shows either time code or tape time.



Time Base Corrector Connection

The BVU-150P may be connected to a Sony TBC to provide broadcast quality playback. External Subcarrier IN and RF (OFF TAPE) OUT are provided for this purpose.

Status and Malfunction Indicators

LEDs are provided for the following status/malfunction indications:

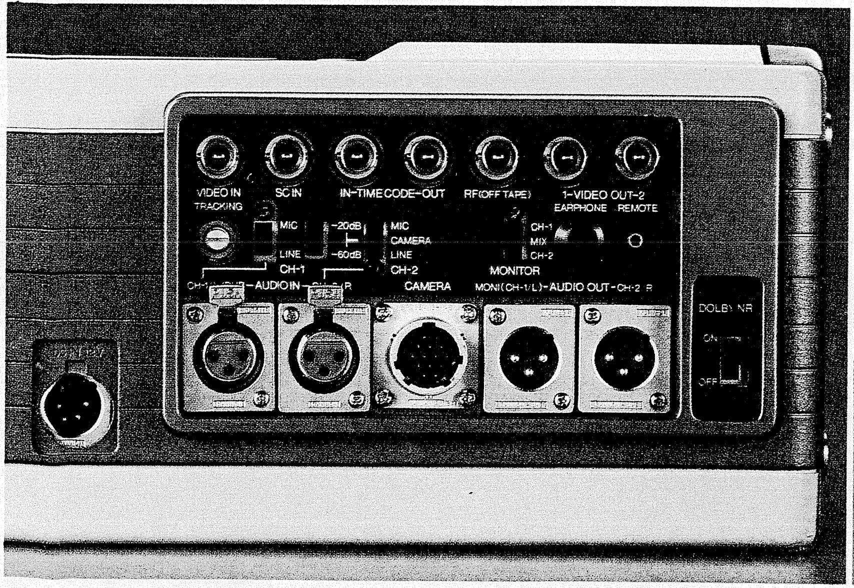
- Record
- Pause
- Presence of RF on tape
- Drum and capstan servo status
- Humidity (Head drum condensation)
- Tape slack
- Tape end (approximately 1.5 min. before end)
- Battery status

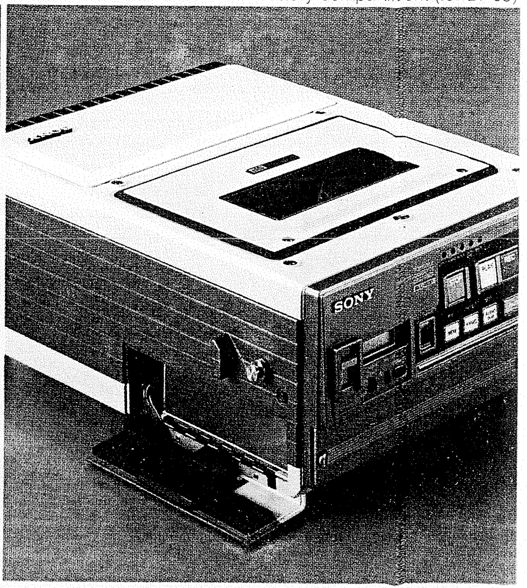
Malfunctions are also indicated on a combined warning LED in the camera viewfinder and a burst of tone in the monitoring earphone.

Camera Connection

All Sony ENG/EFP cameras may be connected to BVU-150P. Recorder control can be exercised from the camera and pictures can be played back in the viewfinder. Status/Malfunctions are also provided in the viewfinder housing.

Dolby is a registered trademark of Dolby Laboratories.

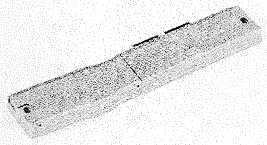




Specifications

GENERAL	
Weight:	Approx. 6.8 kg (15 1b)
Dimensions:	Approx. 263 (W) × 139 (H) × 355 (D) mm (10.3 × 5.5 × 14.0")
Power requirements:	DC 11.0 to 14.0 V (NiCd battery pack BP-90 used) AC operation with AC adaptor AC-500CE (optional)
Power consumption:	Less than 20 W
Operating temperature:	0°C to +40°C (32°F to 104°F)
Storage temperature:	−20°C to +60°C (−4°F to 140°F)
Video tape:	U-matic $\boxed{S}$ tape (Sony KSP-S, KCS-BRK or KCS-K type)
Tape interchangeability:	Compatible with U-matic $\boxed{H}$ VTR
Tape speed:	9.53 cm/sec. ($3\frac{3}{4}$ ips)
Wow and flutter:	±0.2% DIN
Search speed:	Approx. 10 times normal speed in forward and reverse directions
Recording and playback time:	20 min. (with Sony KSP-S20/KCS-20BRK/KCS-20K)
Fast forward time:	Less than 3 min. (with Sony KSP-S20/KCS-20BRK/KCS-20K)
Rewind time:	Less than 3 min. (with Sony KSP-S20/KCS-20BRK/KCS-20K)
Connectors:	Camera; 14-pin (for CCQ cable) Video in; BNC Mic in; XLR-3P Earphone; Mini jack
VIDEO	
Video recording system:	Luminance; FM Chrominance; SC low-range conversion
Input:	PAL composite signal, 1.0Vp-p ±0.3V, sync negative, 75 ohms, unbalanced
Output:	PAL composite signal, 1.0Vp-p ±0.2 V, sync negative, 75 ohms, unbalanced
Horizontal resolution:	SP mode; 300 lines (colour/BW mode) Conventional mode; 260 lines (monochrome/BW mode)
S/N ratio:	SP mode; Better than 45dB (colour mode) Conventional mode; Better than 45dB (colour mode)
K-factor (2T pulse):	Less than 4% (SP mode only)
SC input:	2Vp-p ±1V, 75 ohms, unbalanced
RF output (OFF TAPE):	0.5Vp-p ±0.1V, 75 ohms, unbalanced
AUDIO	
Inputs:	MIC; −60dB, more than 3 kohms, balanced LINE; +4dB, more than 10 kohms, balanced
Outputs:	LINE; +4dB, low impedance, balanced EARPHONE; −33dB to −20dB, 8 ohms load
Distortion:	Less than 2.5%
Frequency response:	SP mode; 50 Hz to 15 kHz ±3dB Conventional mode; 50 Hz to 15 kHz ±4dB
S/N ratio:	Better than 50dB (at 3% distortion level)
TIME CODE	
Input:	0dB ±6dB, 10 kohms, unbalanced (0dB = 1.55Vp-p pulse)
Output:	0dB ±3dB, low impedance, unbalanced (0dB = 1.55Vp-p pulse)
ACCESSORIES	
Supplied:	Carrying case, Shoulder strap, Carrying handle, Earphone, Operation and maintenance manual
Optional:	BKU-150P Time Code Generator AC-500CE AC Adaptor BC-210CE Battery Charger BP-90 Rechargeable Battery RM-680 Remote Control Unit

Design and specifications subject to change without notice.

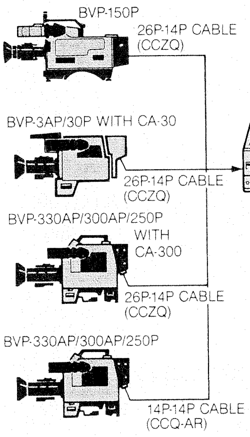


BKU-150P Time code generator (optional)

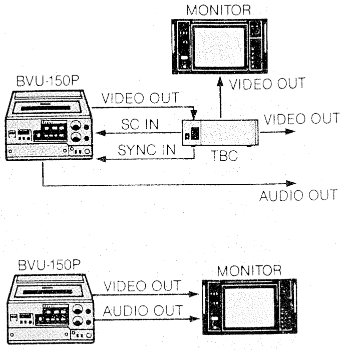
Weight: Approx. 120 g (tentative)
Dimensions: Approx. 196(W) × 37(H) × 16(D)mm
Power consumption: Less than 50mW

Applications

Field recording

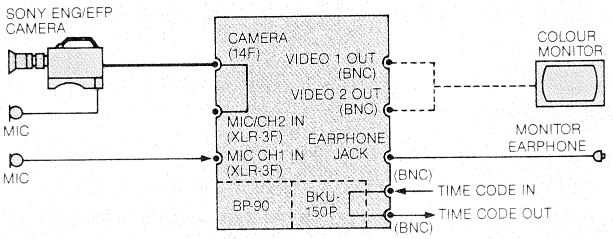


Field playback

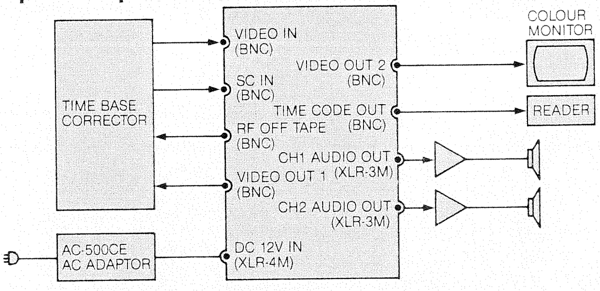


Connections

Field recording with colour camera battery operation



AC power operation with time base corrector



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MK0744HP8505P1-006

PORTABLE VIDEOCASSETTE RECORDER

BVU-150P

Service Engineering Department
Communication Products Group
Sony Corporation

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Kanagawa-ken, 243 Japan
Telephone: (0462)30-5404
Telex: J22262

SONY

U-MATIC ALIGNMENT TAPE

RR5-1SD PAL

Part No. 8-960-036-80
Tape No. 015092624

CONTENTS

min.sec	VIDEO TRACK	AUDIO TRACK	T/C TRACK
0:00	Color bars	Blank	Blank
4:55	Blank		
5:00	Gated sweep (B/W)	1KHz/0VU *1 (-0.1)dB	
7:55	Blank		
8:00	Gated sweep (color)	10KHz/-10VU	
10:55	Blank		
11:00	Pulse & bar (+0)nsec	1KHz - 15KHz *2 1K (ref.) 40 (-0.1)dB 7K (+0.0) 10K (+0.0) 15K (+0.0)	
13:55	Blank		
14:00	Monoscope w/burst Swit'ng position is shifted.	1K/15KHz (NR:ON) *3 1K (-0.5)dB 15K (-0.2)	
16:55	Blank		
17:00 20:00	Pseudo color bars with FM carrier.	Blank	Time code

*1. When playing back this tape,check and adjust the audio reference level of the machine so that its audio output level is the nominal level (0VU) plus the calibration level as follows:

ex. caliblation level = -0.5 dB
acutual output level = +0 VU -0.5 dB = -0.5 dB

*2. Audio signals are recorded every 30 sec. When playing back this tape, check and adjust the audio frequency response of the machine so that its audio level is the reference level at 1KHz plus the calibration level.

*3. Audio signals are recorded every 30 sec. When playing back this tape, check and adjust the audio frequency response of the machine at Noise Reduction ON mode. So that its audio level is the reference level at 1KHz plus the calibration level.

CAUTION :

1. Keep this tape away from strong magnetic fields.
2. Avoid storage at high temperatures. Maximum storage temperature is 40°C (104°F).

SONY

PORTABLE VIDEOCASSETTE RECORDER

BVU-150P

SUPPLEMENT-2

Applicable Manual; 1st Edition (3-694-769-01)
1st Edition Revised 1 (3-694-769-02)
1st Edition Revised 2 (3-694-769-03)

CONTENTS; ELECTRICAL ALIGNMENT

Please file this SUPPLEMENT-2 to your manual, and replace the TABLE OF CONTENTS with attached one.

Professional U-matic S SP
OPERATION AND MAINTENANCE MANUAL

BVU-150P (EK)
9-966-842-03

Sony Corporation

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1985. 10 11

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VO-12 (2/2)
IF-99 15-11
BF-12 15-15
YC-20 15-20
CR-26 15-26
VA-29 15-31
RP-24 15-35

AUDIO

AU-49A
DU-58
DUS-6
DUS-69 15-40
AU-64
AU-65
DUS-94 15-45
AU-51A
DU-58
DUS-3 15-49
CM-19A 15-53
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SWB-4 15-58

SERVO

SV-57C
PC-22 15-63

POWER

PSB-4
CN-26 15-70
CN-100
TM-19

KEY

PA-48 15-76
KY-86 15-81

SYSTEM CONTROL

SY-18C (1/2)
DUS-5 15-86
DUS-33
SY-18C (2/2)
LE-20 15-91
LE-21
SY-22A 15-96
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FRAME

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Circuit Function of the Printed Circuit Board 16-1

VIDEO

VO-12 16-3
IF-99
BF-12 16-10
YC-20 16-13
CR-26 16-19
VA-29 16-24
RP-24 16-28

AUDIO

AU-49A
DU-58
DUS-6 16-31
DUS-69
AU-64
AU-65 16-38
DUS-94
AU-51A
DU-58 16-42
DUS-3
CM-19A
DUS-70 16-46
SWB-4

SERVO

SV-57C 16-49
PC-22

POWER

PSB-4
CN-26 16-57
CN-100
TM-19

KEY

PA-48 16-64
KY-86 16-67

SYSTEM CONTROL

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DUS-5
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LE-20
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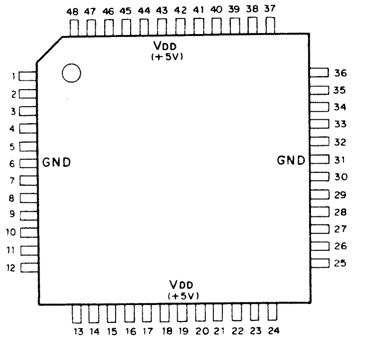
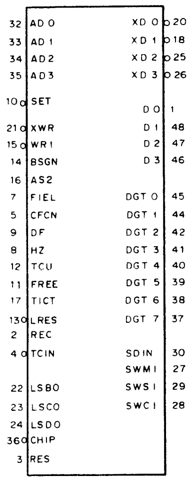
SECTION 3
PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

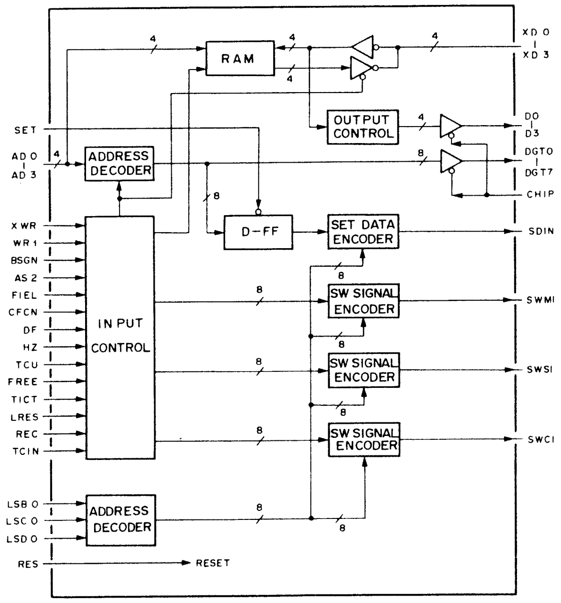
CX23051 (SONY) FLAT PACKAGE
C-MOS TIME CODE GENERATOR (CX7907A) CONTROLLER
— TOP VIEW —



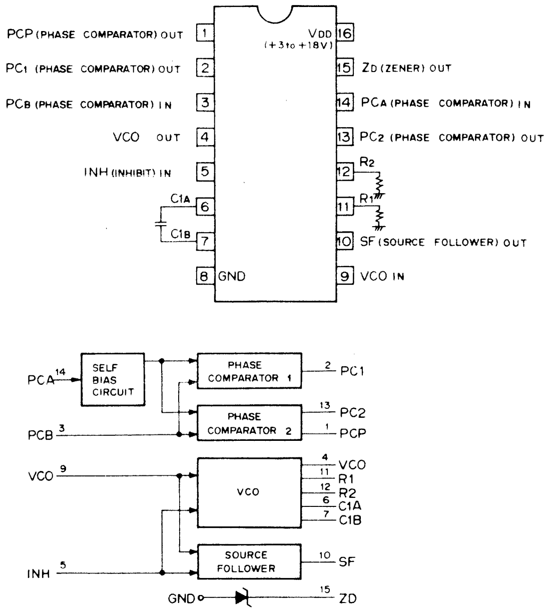
PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL
1		○	DO	13	○		LRES	25	○	○	XD2	37		○	DGT7
2	○		REC	14	○		BSGN	26	○	○	XD3	38		○	DGT 6
3	○		RES	15	○		WR 1	27		○	SWM I	39		○	DGT 5
4	○		TC IN	16	○		AS 2	28		○	SWC I	40		○	DGT 4
5	○		CFCN	17	○		TICT	29		○	SWS I	41		○	DGT 3
6			GND	18	○	○	XD 1	30		○	SDIN	42		○	DGT 2
7	○		FIEL	19			VDD	31			GND	43			VDD
8	○		HZ	20	○	○	XD 0	32	○		AD 0	44		○	DGT 1
9	○		DF	21	○		XWR	33	○		AD 1	45		○	DGT 0
10	○		SET	22	○		LSB 0	34	○		AD 2	46		○	D3
11	○		FREE	23	○		LSC 0	35	○		AD 3	47		○	D2
12	○		TCU	24	○		LSD 0	36	○		CHIP	48		○	D 1



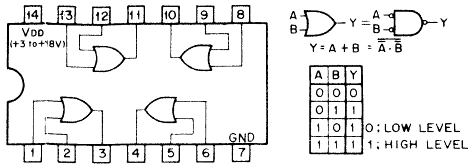
AD 0 | AD 3	ADDRESS DATA INPUT
AS 2	L : COLOR FRAME LOCK INPUT
BSGN	BUSY GENERATOR INPUT
CFCN	COLOR FRAME CONTROL INPUT
CHIP	CHIP SELECT INPUT
D O | D 3	DISPLAY DATA OUTPUT
D F	H : DROP FRAME/L : NDF INPUT
DGT 0 | DGT 7	DIGIT DATA OUTPUT
FIEL	FIELD SIGNAL INPUT
FREE	H : FREE RUN/ L : REC RUN INPUT
HZ	H : 30Hz / L : 25Hz INPUT
LRES	L : TIMER RESET INPUT
LSB O LSC O LSD O	LTC SYNCHRONOUS SIGNAL INPUT
REC	H : REC MODE INPUT
RES	POWER ON RESET INPUT
SDIN	SET DATA OUTPUT
SET	DATA SET PULSE INPUT
SWCI SWMI SWSI	SWITCHES SIGNAL OUTPUT
TCIN	SLAVE LOCK SIGNAL INPUT
TCU	H : TC/L : UB INPUT
TICT	H : TC, UB/L : TIMER INPUT
WR 1	WRITE 1 (CONNECT TO BSGN)
X D O | X D 3	DATA BUS INPUT/OUTPUT
XWR	WRITE PULSE INPUT



HD14046BP (HITACHI)
MC14046BCP (MOTOROLA)
C-MOS PHASE LOCKED LOOP
— TOP VIEW —



TC4071BF (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT OR GATE
— TOP VIEW —

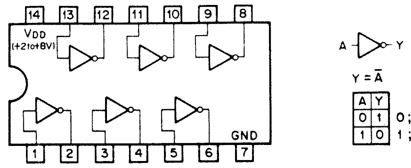


$Y = A + B = \overline{\overline{A} \cdot \overline{B}}$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

TC40H004F (TOSHIBA) FLAT PACKAGE
C-MOS INVERTER
— TOP VIEW —

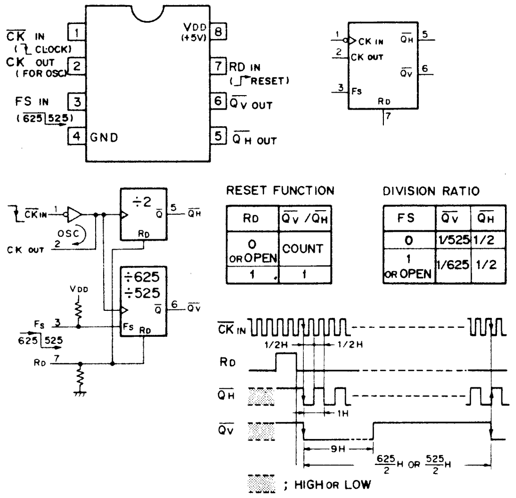


$Y = \overline{A}$

A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

SM6430C (NPC)
C-MOS OSC. 1/2 AND 1/525 OR 1/625 DIVIDER
— TOP VIEW —



▨ ; HIGH OR LOW

RESET FUNCTION

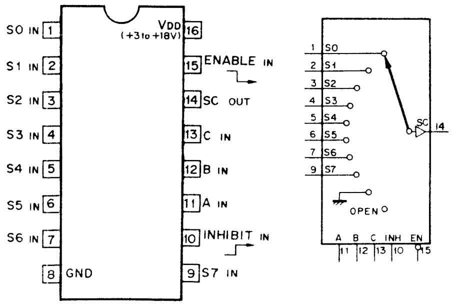
RD	$\overline{Q}$V / $\overline{Q}$H
0 OR OPEN	COUNT
1	1

DIVISION RATIO

FS	$\overline{Q}$V	$\overline{Q}$H
0	1/525	1/2
1 OR OPEN	1/625	1/2

0; LOW LEVEL
1 ; HIGH LEVEL

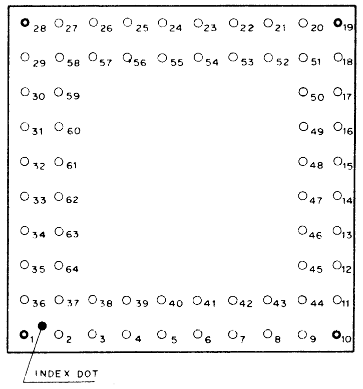
TC4512BF (TOSHIBA) FLAT PACKAGE
C-MOS 8-CHANNEL DATA SELECTOR/MULTIPLEXER
— TOP VIEW —

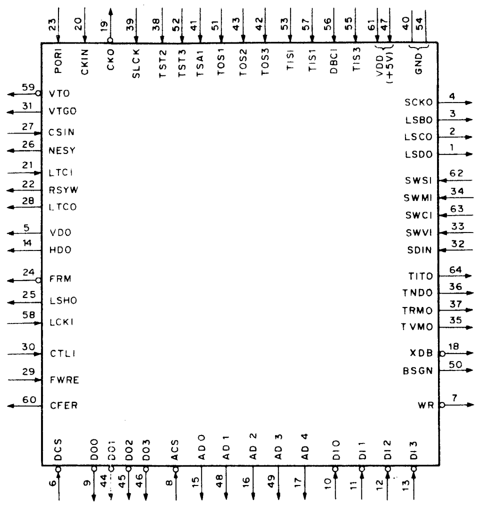


CONTROL INPUTS					OUTPUT
EN	INH	C	B	A	SC
0	0	0	0	0	S0
0	0	0	0	1	S1
0	0	0	1	0	S2
0	0	0	1	1	S3
0	0	1	0	0	S4
0	0	1	0	1	S5
0	0	1	1	0	S6
0	0	1	1	1	S7
0	1	X	X	X	GND
1	X	X	X	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

CX7907A (SONY)
C-MOS TIME CODE GENERATOR
— TOP VIEW —




PORI CKIN CKO SLCK TST2 TST3 TSAI TOS1 TOS2 TOS3 TISI TIS1 DBCI TIS3 VDD (+5V) GND
VTO VTGO CSIN NESY LTCI RSYW LTCO VDO HDO FRM LSHO LCKI CTLI FWRE CFER
SCKO LSBO LSCO LSDO SWSI SWMI SWCI SWVI SDIN TITO TNDO TRMO TVMO XDB BSGN WR
DCS DO0 DO1 DO2 DO3 ACS AD0 AD1 AD2 AD3 AD4 DI0 DI1 DI2 DI3

PIN ASSIGNMENT

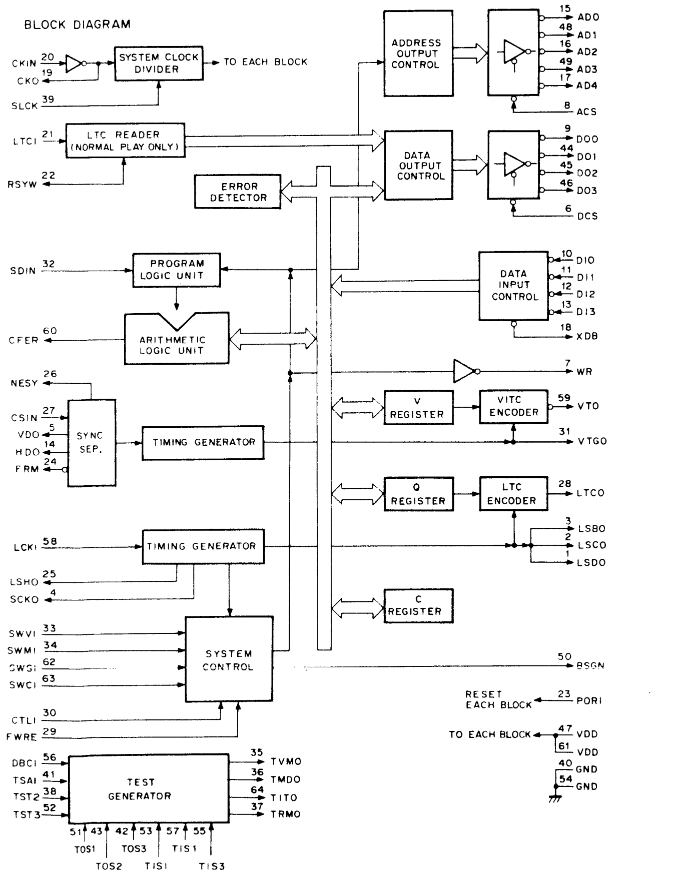
Pin No.	IN	OUT	SYMBOL
1		o	LSDO
2		o	LSCO
3		o	LSBO
4		o	SCKO
5		o	VDO
6	o		DCS
7		o	WR
8	o		ACS
9		o	DO0
10	o		DI0
11	o		DI1
12	o		DI2
13	o		DI3
14		o	HDO
15		o	AD0
16		o	AD2

Pin No.	IN	OUT	SYMBOL
17		o	AD4
18		o	XDB
19		o	CKO
20	o		CKIN
21	o		LTCI
22		o	RSYW
23	o		PORI
24		o	FRM
25		o	LSHO
26		o	NESY
27	o		CSIN
28		o	LTCO
29	o		FWRE
30	o		CTLI
31		o	VTGO
32	o		SDIN

Pin No.	IN	OUT	SYMBOL
33	o		SWVI
34	o		SWMI
35		o	TVMO
36		o	TNDO
37		o	TRMO
38	o		TST2
39	o		SLCK
40		o	GND
41	o		TSAI
42	o		TOS3
43	o		TOS2
44		o	DO1
45		o	DO2
46		o	DO3
47	o		VDD(+5V)
48		o	AD1

Pin No.	IN	OUT	SYMBOL
49		o	AD3
50		o	BSGN
51	o		TOS1
52	o		TST3
53	o		TISI
54		o	GND
55	o		TIS3
56	o		DBCI
57	o		TIS1
58	o		LCKI
59		o	VTO
60		o	CFER
61	o		VDD(+5V)
62	o		SWSI
63	o		SWCI
64		o	TITO

BLOCK DIAGRAM



FUNCTIONAL PIN DEFINITION

Pin No.	SYMBOL	DESCRIPTION
8	ACS	ADDRESS LINE CHIP SELECT INPUT
15	AD0	ADDRESS DATA OUTPUT
48	AD1	
16	AD2	
49	AD3	
17	AD4	
50	BSGN	BUSY GENERATOR OUTPUT
60	CFER	COLOR FRAME ERROR FLAG OUTPUT
20	CKIN	SYSTEM CLOCK INPUT
19	CKO	CLOCK OUTPUT
27	CSIN	COMPOSITE SYNC INPUT
30	CTLI	CTL(TIMER) SIGNAL INPUT (↓)
6	DCS	DATA LINE CHIP SELECT INPUT (NEGATIVE-LOGIC)
10	DI0	DATA BUS INPUT (NEGATIVE-LOGIC)
11	DI1	
12	DI2	
13	DI3	
9	DO0	DATA BUS OUTPUT (NEGATIVE-LOGIC)
44	DO1	
45	DO2	
46	DO3	
24	FRM	FRAME SIGNAL OUTPUT (NEGATIVE-LOGIC)
29	FWRE	CTL DIRECTION INPUT
14	HDO	HORIZONTAL SYNC DRIVE OUTPUT
58	LCKI	LTC CLOCK INPUT (SMPTE 9.6kHz/EBU 8kHz)
3	LSBO	LTC SYNCHRONOUS SIGNAL B OUTPUT
2	LSCO	LTC SYNCHRONOUS SIGNAL C OUTPUT
1	LSDO	LTC SYNCHRONOUS SIGNAL D OUTPUT
25	LSHO	LTC SYNCHRONOUS SIGNAL H OUTPUT
21	LTCI	LTC INPUT
28	LTCO	LTC SIGNAL OUTPUT
26	NESY	LOST-SYNC FLAG OUTPUT
23	PORI	POWER ON RESET INPUT
22	RSYW	READ SYNC WORD OUTPUT
4	SCKO	SWITCHES SIGNAL IN CLOCK OUTPUT
32	SDIN	SERIAL DATA INPUT
39	SLCK	SELECT CLOCK INPUT
63	SWCI	SWITCHES SIGNAL C INPUT
34	SWMI	SWITCHES SIGNAL M INPUT
62	SWSI	SWITCHES SIGNAL S INPUT
33	SWVI	SWITCHES SIGNAL V INPUT
5	VDO	VERTICAL SYNC DRIVE OUTPUT
31	VTGO	VITC GATE SIGNAL OUTPUT
59	VTO	VITC SIGNAL OUTPUT (NEGATIVE-LOGIC)
7	WR	WRITE SIGNAL OUTPUT (NEGATIVE-LOGIC)
18	XDB	EXTERNAL DATA BUS IN FLAG OUTPUT (NEGATIVE-LOGIC)
47	VDD	POWER LINE (+5V)
61	VDD	
40	GND	GND LINE
54	GND	
56	DBCI	TEST INPUT (TO BE CONNECTED WITH GND)
57	TIS1	
55	TIS3	
53	TISI	
51	TOS1	
43	TOS2	
42	TOS3	
41	TSAI	
38	TST2	
52	TST3	
64	TITO	TEST OUTPUT (TO BE LEFT OPEN)
36	TNDO	
37	TRMO	
35	TVMO	

#32 SDIN

LSDO	LSCO	LSBO	SDIN	FUNCTION
0	0	0	↓	INCREASE IN BIT 'FR or U1'
0	0	1		INCREASE IN BIT 'FT or U2'
0	1	0		INCREASE IN BIT 'SE or U3'
0	1	1		INCREASE IN BIT 'ST or U4'
1	0	0		INCREASE IN BIT 'MN or U5'
1	0	1		INCREASE IN BIT 'MT or U6'
1	1	0		INCREASE IN BIT 'HR or U7'
1	1	1		INCREASE IN BIT 'HT or U8'

NOTE;INFLUENCED BIT IS DECIDED
BY FIRST 2 BITS OF SWCI.

#33 SWVI

LSDO	LSCO	LSBO	SWVI	FUNCTION
0	0	0	SW1A†	VITC POSITION SELECT A
0	0	1	SW1B†	
0	1	0	SW1C†	
0	1	1	SW1D†	
1	0	0	SW2A†	VITC POSITION SELECT B
1	0	1	SW2B†	
1	1	0	SW2C†	
1	1	1	SW2D†	

†;VITC POSITION SELECT

SW1D SW2D	SW1C SW2C	SW1B SW2B	SW1A SW2A	INSERTION LINE	
				NTSC	PAL,SECAM
0	0	0	0	LINE 25	LINE 22,335
0	0	0	1	24	21,334
0	0	1	0	23	20,333
0	0	1	1	22	19,332
0	1	0	0	21	18,331
0	1	0	1	20	17,330
0	1	1	0	19	16,329
0	1	1	1	18	15,328
1	0	0	0	17	14,327
1	0	0	1	16	13,326
1	0	1	0	15	12,325
1	0	1	1	14	11,324
1	1	0	0	13	10,323
1	1	0	1	12	9,322
1	1	1	0	11	8,321
1	1	1	1	10	7,320

#34 SWMI

LSDO	LSCO	LSBO	SWMI	FUNCTION
0	0	0	x	INSERT SWMI DATA INTO BIT 'AS1'(NEGATIVE-LOGIC)
0	0	1	x	INSERT SWMI DATA INTO BIT 'AS2'(NEGATIVE-LOGIC)
0	1	0	x	INSERT SWMI DATA INTO BIT 'AS3'(NEGATIVE-LOGIC)
0	1	1	x	INSERT SWMI DATA INTO BIT 'AS4'(NEGATIVE-LOGIC)
1	0	0	x	INSERT SWMI DATA INTO BIT 'AS5'(NEGATIVE-LOGIC)
1	0	1	x	INSERT SWMI DATA INTO BIT 'AS6'(NEGATIVE-LOGIC)
1	1	0	↑	COLOR FRAME LOCK IN FIELD 1
1	1	1	0	COLOR FRAME OFF
1	1	1	1	COLOR FRAME ON

X;DON'T CARE.

#62 SWSI

LSDO	LSCO	LSBO	SWSI	FUNCTION
0	0	0	FBS1*	VITC FIELD MARK/ LTC PHASE CORRECTION POSITION SELECT
0	0	1	FBS2*	
0	1	0	FBS3*	
0	1	1	0	PHASE CORRECTION ON
0	1	1	1	PHASE CORRECTION OFF
1	0	0	S1**	SIGNAL FORMAT SELECT
1	0	1	S2**	
1	1	0	S4**	
1	1	1	x	-

x;DON'T CARE.

*;VITC FIELD MARK/LTC PHASE CORRECTION
POSITION SELECT

FBS3	FBS2	FBS1	FIELD MARK POSITION	LTC BIT No.
0	0	0	AS1	10
0	0	1	AS2	11
0	1	0	AS3	27
0	1	1	AS4	43
1	0	0	AS5	58
1	0	1	AS6	59
1	1	0	-	-
1	1	1	-	-

NOTE;LTC PHASE CORRECTION BIT OF
CX7907 IS FIXED ON BIT-63.

**;SIGNAL FORMAT SELECT

S4	S2	S1	FORMAT	FRAME
0	0	0	FILM	24
0	0	1	NOT ALLOWED	-
0	1	x		
1	0	0	PAL,SECAM	25
1	0	1	NOT ALLOWED	-
1	1	0	NTSC NDF	30
1	1	1	NTSC DF	30

DF;DROP FRAME
NDF;NON DROP FRAME
x;DON'T CARE.

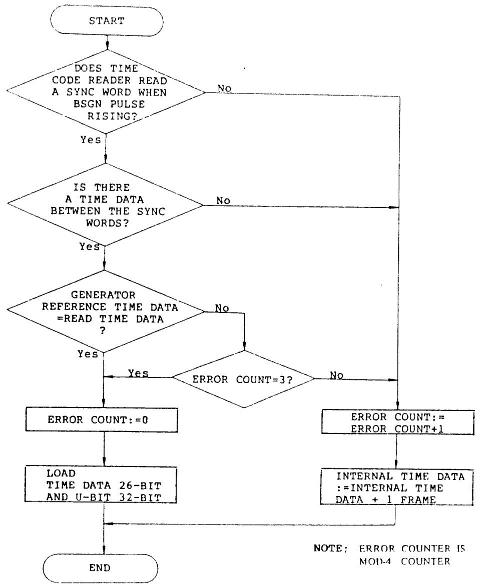
0;LOW LEVEL
1;HIGH LEVEL

#63 SWCI

LSDO	LSCO	LSBO	SWCI	FUNCTION	
0	0	0	0	U-BIT	IN/OUT DATA SELECT*1
0	0	0	1	TIME	
0	0	1	0	CTL	
0	0	1	1	TIME/U-BIT	
0	1	0	x	-	
0	1	1	0	DATA RESET ON*2	
0	1	1	1	DATA RESET OFF	
1	0	0	0	TIME DATA HOLD	
1	0	0	1	TIME DATA RUN	
1	0	1	↓	EXTERNAL DATA LOAD*2	
1	1	0	0	EXTRAPOLATION ON	
1	1	0	1	EXTRAPOLATION OFF	
1	1	1	x	-	

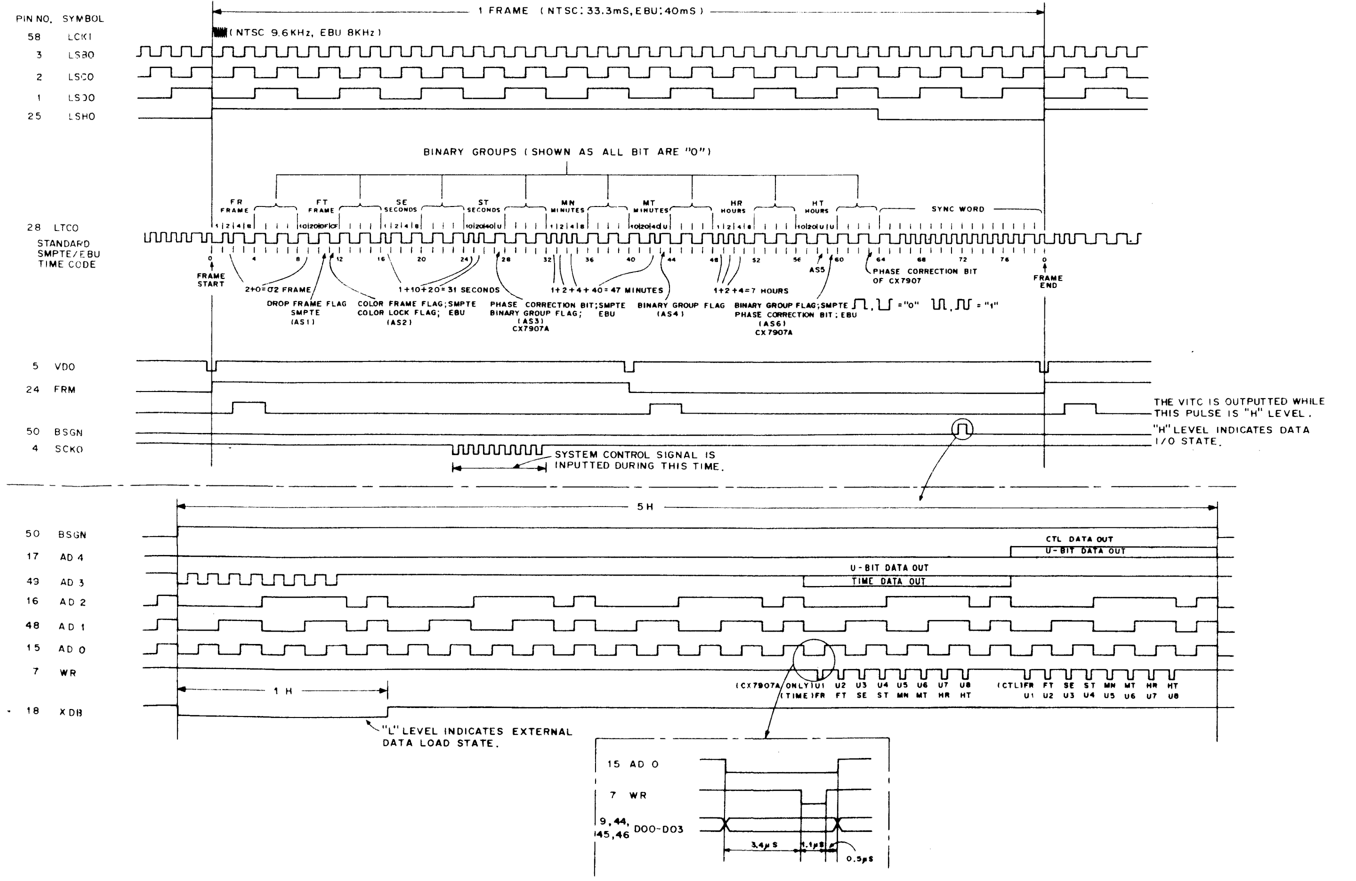
x; DON'T CARE.
*1;REFER TO TIMING CHART(DATA OUT).
*2;INFLUENCED DATA IS DECIDED BY
FIRST 2 BITS OF SWCI.

ERROR BYPASS ALGORITHM

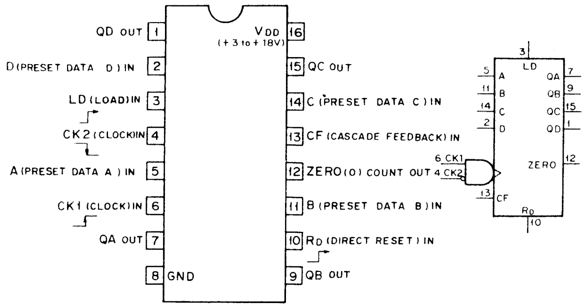

START
DOES TIME CODE READER READ A SYNC WORD WHEN BSGN PULSE RISING?
No
Yes
IS THERE A TIME DATA BETWEEN THE SYNC WORDS?
No
Yes
GENERATOR REFERENCE TIME DATA =READ TIME DATA ?
No
Yes
ERROR COUNT=3?
Yes
No
ERROR COUNT:=0
ERROR COUNT:= ERROR COUNT+1
LOAD TIME DATA 26-BIT AND U-BIT 32-BIT
INTERNAL TIME DATA :=INTERNAL TIME DATA + 1 FRAME
END

NOTE; ERROR COUNTER IS
MOD-4 COUNTER

TIMING CHART



TC4526BF (TOSHIBA) FLAT PACKAGE
C-MOS PROGRAMMABLE DIVIDE-BY-N 4-BIT BINARY DOWN COUNTER
— TOP VIEW —

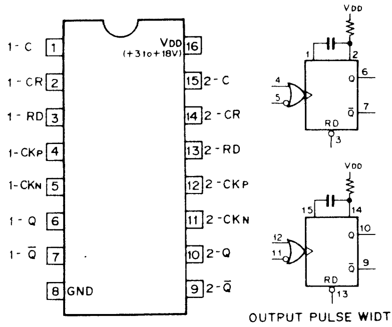


CK1	CK2	LD	RD	ACTION
0	0	0	0	NO COUNT
↑	0	0	0	COUNT ↓
X	1	0	0	NO COUNT
1	↓	0	0	COUNT ↓
X	X	1	0	PRESET
X	X	X	1	RESET

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

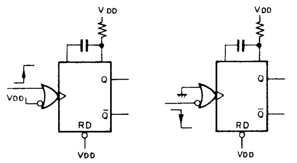
COUNT	OUTPUTS				
	QD	QC	QB	QA	ZERO
15	1	1	1	1	0
14	1	1	1	0	0
13	1	1	0	1	0
12	1	1	0	0	0
11	1	0	1	1	0
10	1	0	1	0	0
9	1	0	0	1	0
8	1	0	0	0	0
7	0	1	1	1	0
6	0	1	1	0	0
5	0	1	0	1	0
4	0	1	0	0	0
3	0	0	1	1	0
2	0	0	1	0	0
1	0	0	0	1	0
0	0	0	0	0	1

TC4538BF (TOSHIBA) FLAT PACKAGE
C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE
MONOSTABLE MULTIVIBRATOR
— TOP VIEW —

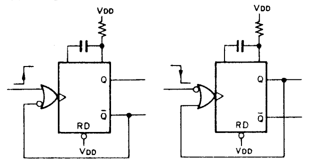


OUTPUT PULSE WIDTH=CR

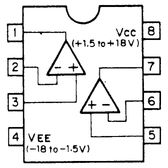
RETRIGGERABLE M.M.V



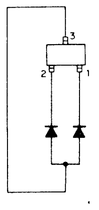
NON-RETRIGGERABLE M.M.V



TL062CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(JFET INPUT)
— TOP VIEW —

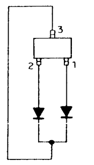


TOP VIEW (SCALE 4/1)



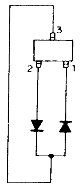
1S2835

TOP VIEW (SCALE 4/1)



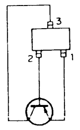
1S2837

TOP VIEW (SCALE 4/1)



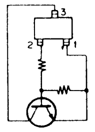
1SS123

TOP VIEW (SCALE 4/1)



2SA1226
2SA812

TOP VIEW (SCALE 4/1)

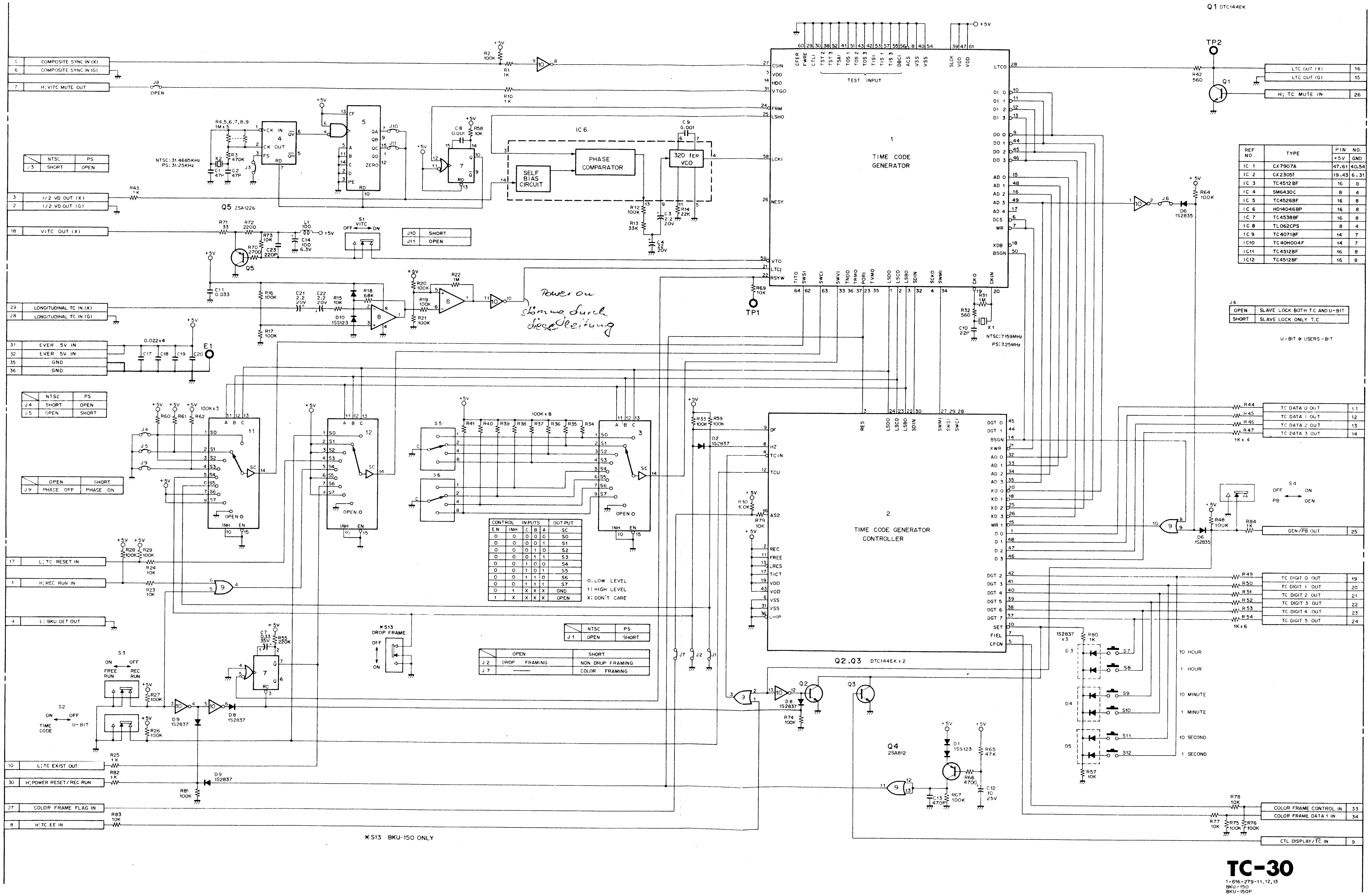


DTC144EK

The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

等価回路は IC メーカーの Data Book に従いました。

TC-30 ; TIME CODE GEN/READER



Power on
Störung durch
diese Leitung

	NTSC	PS
J3	SHORT	OPEN

J10	SHORT
J11	OPEN

	NTSC	PS
J4	SHORT	OPEN
J5	OPEN	SHORT

	OPEN	SHORT
J9	PHASE OFF	PHASE ON

CONTROL	INPUTS				OUT PUT
EN	INH	C	B	A	SC
0	0	0	0	0	S0
0	0	0	0	1	S1
0	0	0	1	0	S2
0	0	0	1	1	S3
0	0	1	0	0	S4
0	0	1	0	1	S5
0	0	1	1	0	S6
0	0	1	1	1	S7
0	1	X	X	X	GND
1	X	X	X	X	OPEN

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE

	NTSC	PS
J1	OPEN	SHORT

	OPEN	SHORT
J2	DROP FRAMING	NON DROP FRAMING
J7	——	COLOR FRAMING

*S13 BKU-150 ONLY

REF NO.	TYPE	PIN NO.	
		+5V	GND
IC 1	CX7907A	47,61	40,54
IC 2	CX23051	19,43	6,31
IC 3	TC4512BF	16	8
IC 4	SM6430C	8	4
IC 5	TC4526BF	16	8
IC 6	HD14046BP	16	8
IC 7	TC4538BF	16	8
IC 8	TL062CPS	8	4
IC 9	TC4071BF	14	7
IC10	TC40H004F	14	7
IC11	TC4512BF	16	8
IC12	TC4512BF	16	8

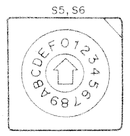
J6

OPEN	SLAVE LOCK BOTH T.C AND U-BIT
SHORT	SLAVE LOCK ONLY T.C

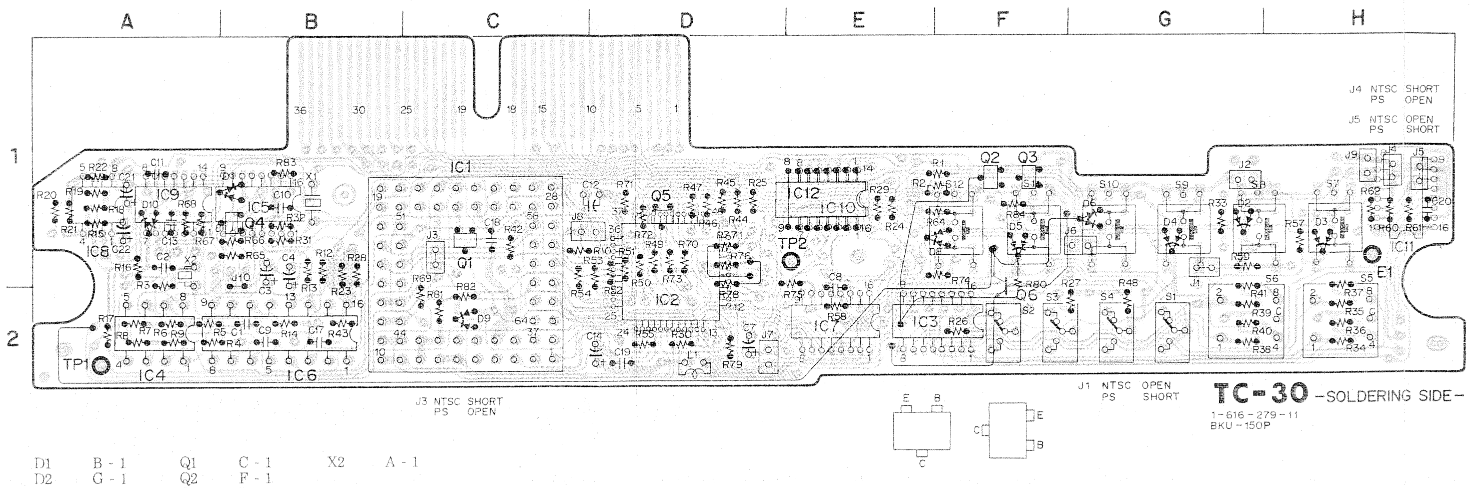
U-BIT ⇒ USERS-BIT

TC-30 ; TIME CODE GEN/READER

S/N 10001 TO 10022 (EK)

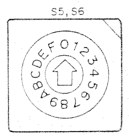


Display No.	Connect Pin No.			
	1	2	4	8
0				
1	○			
2		○		
3	○	○		
4			○	
5	○		○	
6		○	○	
7	○	○	○	
8				○
9	○			○
A		○		○
B	○	○		○
C			○	○
D	○		○	○
E		○	○	○
F	○	○	○	○

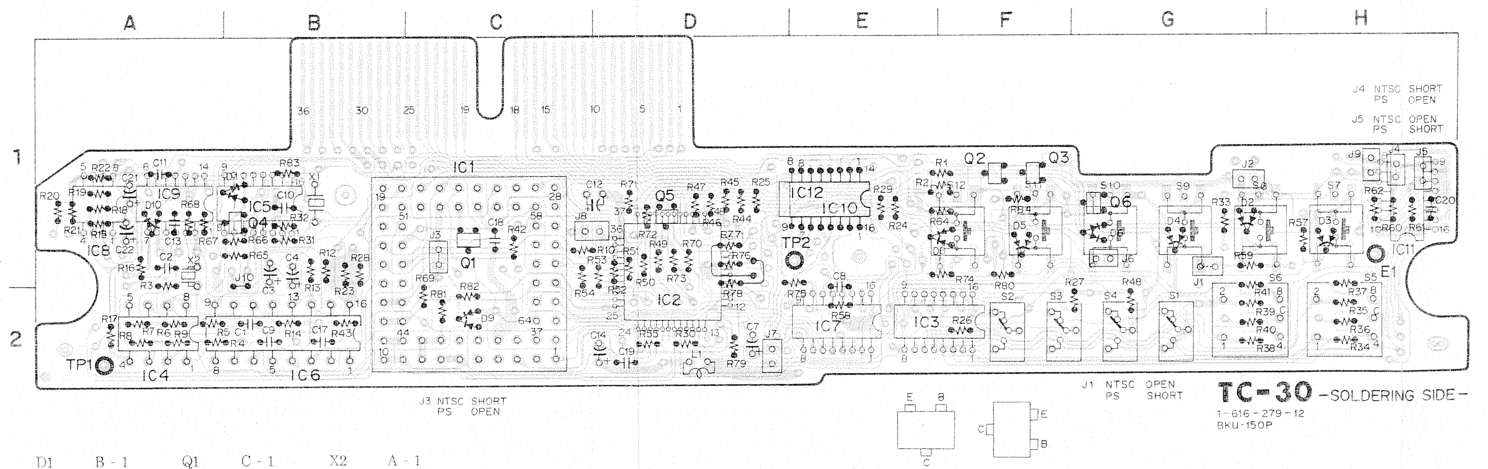


D1	B - 1	Q1	C - 1	X2	A - 1
D2	G - 1	Q2	F - 1		
D3	H - 1	Q3	F - 1		
D4	G - 1	Q4	B - 1		
D5	F - 1	Q5	D - 1		
D6	G - 1				
D8	F - 1				
D9	C - 2	S1	G - 2		
D10	A - 1	S2	F - 2		
		S3	F - 2		
E1	H - 1	S4	G - 2		
		S5	H - 2		
IC1	C - 1	S6	G - 2		
IC2	D - 1	S7	H - 1		
IC3	F - 2	S8	G - 1		
IC4	A - 2	S9	G - 1		
IC5	B - 1	S10	G - 1		
IC6	B - 2	S11	F - 1		
IC7	E - 2	S12	F - 1		
IC8	A - 1				
IC9	A - 1	TP1	A - 2		
IC10	E - 1	TP2	E - 1		
IC11	H - 1				
IC12	E - 1	X1	B - 1		

S/N 10023 TO 10122 (EK)



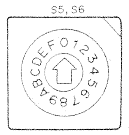
Display No.	Connect Pin No.			
	1	2	4	8
0				
1	○			
2		○		
3	○	○		
4			○	
5	○		○	
6		○	○	
7	○	○	○	
8				○
9	○			○
A		○		○
B	○	○		○
C			○	○
D	○		○	○
E		○	○	○
F	○	○	○	○



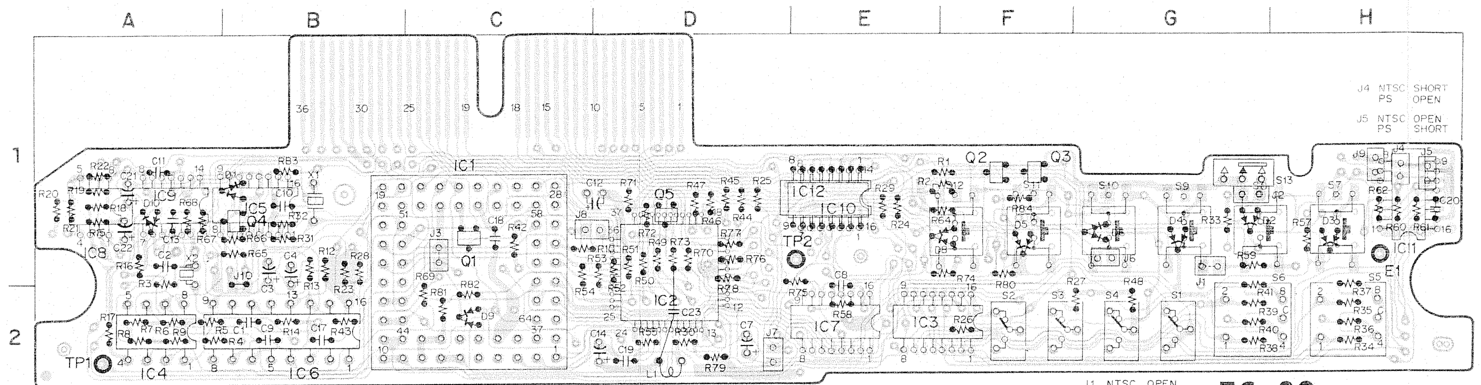
D1	B - 1	Q1	C - 1	X2	A - 1
D2	G - 1	Q2	F - 1		
D3	H - 1	Q3	F - 1		
D4	G - 1	Q4	B - 1		
D5	F - 1	Q5	D - 1		
D6	G - 1				
D8	F - 1				
D9	C - 2	S1	G - 2		
D10	A - 1	S2	F - 2		
		S3	F - 2		
E1	H - 1	S4	G - 2		
		S5	H - 2		
IC1	C - 1	S6	G - 2		
IC2	D - 1	S7	H - 1		
IC3	F - 2	S8	G - 1		
IC4	A - 2	S9	G - 1		
IC5	B - 1	S10	G - 1		
IC6	B - 2	S11	F - 1		
IC7	E - 2	S12	F - 1		
IC8	A - 1				
IC9	A - 1	TP1	A - 2		
IC10	E - 1	TP2	E - 1		
IC11	H - 1				
IC12	E - 1	X1	B - 1		

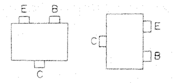
TC-30; TIME CODE GEN/READER

S/N 10001 TO 10050 (UC, J)
S/N 10123 TO 10322 (EK)



Display No.	Connect Pin No.			
	1	2	4	8
0				
1	○			
2		○		
3	○	○		
4			○	
5	○		○	
6		○	○	
7	○	○	○	
8				○
9	○			○
A		○		○
B	○	○		○
C			○	○
D	○		○	○
E		○	○	○
F	○	○	○	○





TC-30 -SOLDERING SIDE-
1-616-279-13
BKU-150
BKU-150P

D1	B - 1	Q1	C - 1	X2	A - 1
D2	G - 1	Q2	F - 1		
D3	H - 1	Q3	F - 1		
D4	G - 1	Q4	B - 1		
D5	F - 1	Q5	D - 1		
D6	G - 1				
D8	F - 1	S1	G - 2		
D9	C - 2	S2	F - 2		
D10	A - 1	S3	F - 2		
		S4	G - 2		
E1	H - 1	S5	H - 2		
		S6	G - 2		
IC1	C - 1	S7	H - 1		
IC2	D - 1	S8	G - 1		
IC3	F - 2	S9	G - 1		
IC4	A - 2	S10	G - 1		
IC5	B - 1	S11	F - 1		
IC6	B - 2	S12	F - 1		
IC7	E - 2	S13	G - 1		
IC8	A - 1				
IC9	A - 1	TP1	A - 2		
IC10	E - 1	TP2	E - 1		
IC11	H - 1				
IC12	E - 1	X1	B - 1		

SECTION 4
VIDEO CIRCUIT

Introduction to the BVU-150P Video System
1. Input Video Circuit
2. Y/C Separator Circuit
3. Luminance Processing
    3-1. REC Y Signal
    3-2. AGC Amplifier
    3-3. High-Frequency Preemphasis Circuit
    3-4. Preemphasis Circuit
    3-5. Modulator Circuit
    3-6. REC HF Circuit
    3-7. REC Amplifier Circuit
    3-8. PB Amplifier Circuit (RP-24)
    3-9. PB Amplifier Circuit (VO-12)
    3-10 PB HF Circuit
    3-11. Demodulator
    3-12. DOC Circuit
    3-13. Noise Canceller
4. Chrominance Processing
    4-1. ACC, APC and AFC Circuits
    4-2. Lower-Frequency Response Compensation Circuit
    4-3. PB Chroma Processing
    4-4. DG Compensator
5. SP/Conventional Mode Detection Circuit
6. CONFI Video Circuit

Introduction to the BVU-150P Video System

In addition to the U-matic high band record/playback functions, the BVU-150P also provides superior record/playback functions.

The superior performance (SP) recording function is activated only when the new KSP-S20 or KSP-S10 is used.

The SP recording format will be described hereafter. Differences between the current U-matic record/playback machine and the BVU-150P are as listed below.

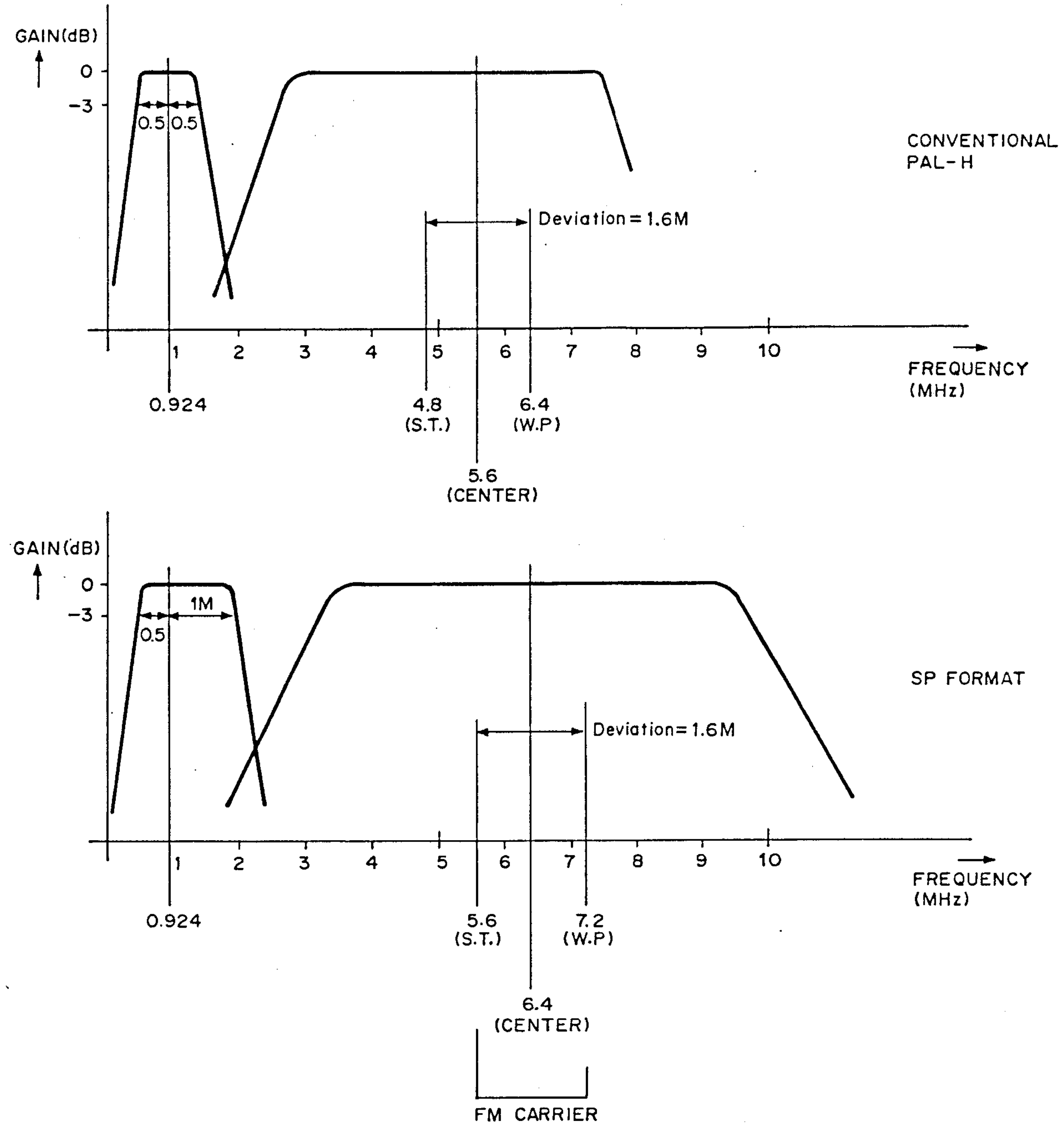
Y channel

<Parameters>		<Modifications>
. Increases resolution (Improves frequency response)	⟶	Raises the carrier frequency (the Y signal bandwidth widens).
. Suppresses cross-color and moire	⟶	Raises the carrier frequency and employ the horizontal correlator.
. Improves waveform response (K factor)	⟶	Equalizes the phase responses in the RF and video systems.

C channel

<Parameters>		<Modifications>
. Increases resolution (Color sharpness)	⟶	Extends the chroma channel bandwidth.
. Decreases ringing	⟶	Improves lower frequency responses.

In order to improve the above parameters, the frequency response of the Y/C signal in the SP recording format is as specified below.



Circuit Descriptions of the BVU-150P Video System

The BVU-150P video system, which employs a U-matic high-band recording/playback system and a new superior performance (SP) recording/playback system, provides better picture quality. It improves not only the SP recording format but also the new circuitry. The BVU-150P video circuit consists of 7 boards. The main functions of each board are as listed below.

Boards	Functions
VO-12 board	Main video circuit
YC-20 board	Y/C separator with a correlator
CR-26 board	Chroma processing circuit (ACC, APC and AFC)
VA-29 board	Y/C mixer, noise canceller and video output amplifier
RP-24 board	REC/PB RF amplifier and camera video output
BF-12 board	CONFI demodulator and camera video output
PA-45 board	CONFI head AMP (RF AMP)

1. INPUT VIDEO CIRCUIT (ON VO-12 (2/2) BOARD)

The input video signal is fed through CN17-2 (signal line) and CN17-3 (GND) on the VO-12 board to floating amplifier Q1 through Q3.

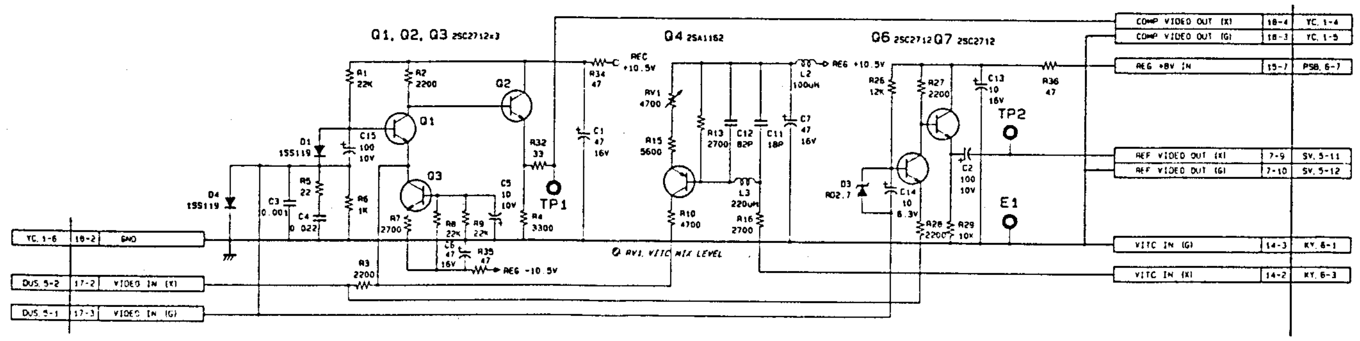
The ground line of the input video signal supplied to CN17-2 is separated from that of the VTR frame chassis.

A video signal can be input, in parallel, from either the LINE or CAMERA input terminal. However, the BVU-150P provides no LINE/CAMERA select switch and no automatic detector circuit.

If input signals are fed from both LINE and CAMERA input terminals, these signals are mixed.

When a BKU-150P optional time code generator is connected to the BVU-150P and the VITC signal is sent to the BVU-150P, the VITC signal is mixed with the input video signal after passing through an LPF (C11, C12, L3, R13 and R16) and an amplifier (RV1, R15, R10 and Q4). Next this signal is sent to YC-20 board.

The mixing ratio of the VITC signal and the input video signal is adjusted using RV1.



2. Y/C SEPARATOR CIRCUIT (ON YC-20 BOARD)

The YC-20 board separates the composite video signal into its chroma and Y-signal components.

The composite video signal is fed to the Y/C separator through transistor Q1 on the YC-20 board.

The Y signal is separated by the low-pass filter after passing through TP1 in the Y channel.

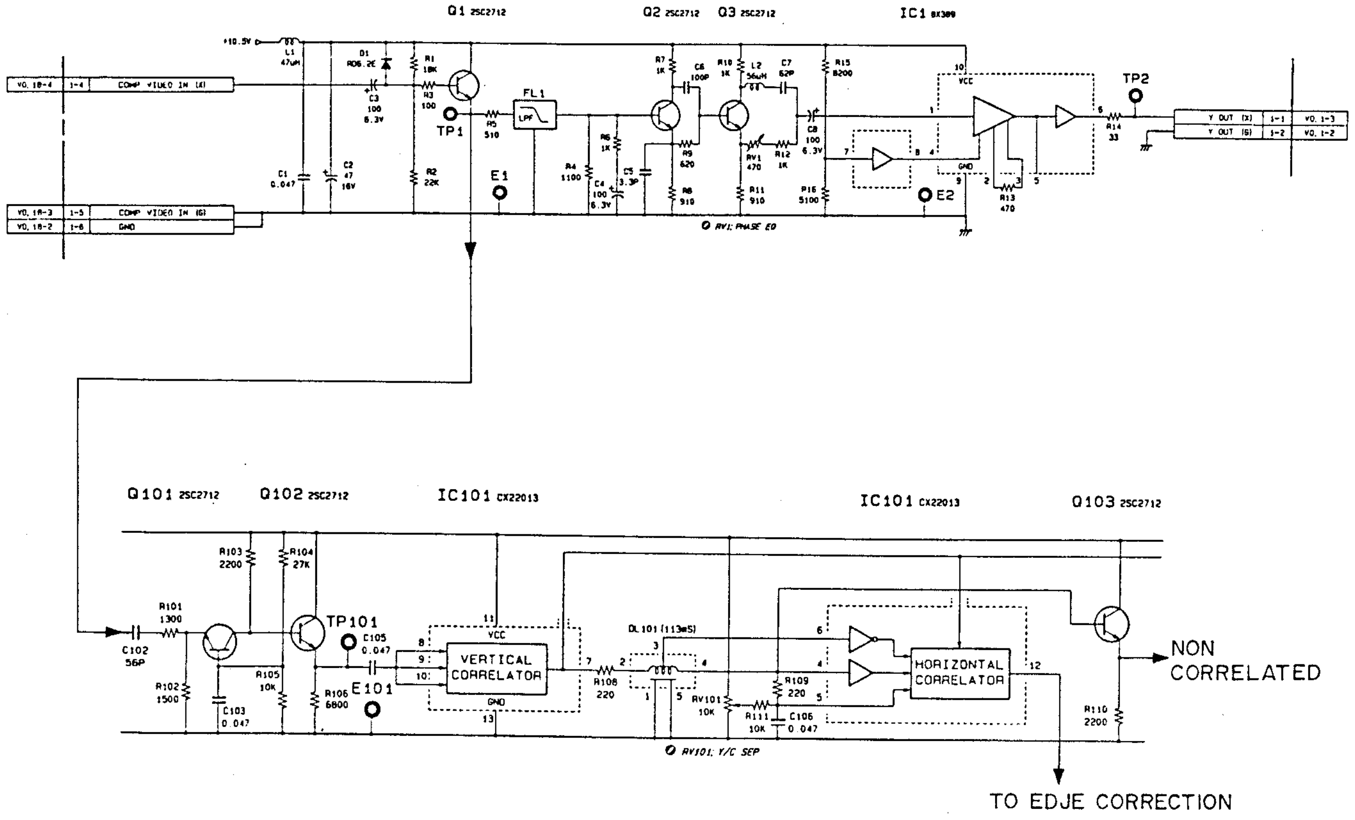
After passing through the low-pass filter, the Y signal is sent to the phase equalizer to compensate group delay.

The phase equalizer consists of primary and secondary phase equalizing transistors Q2 and Q3. The phase equalizer output is fed to the VO-12 board through Y-channel amplifier IC1.

The chroma-signal component is extracted by the high-pass filter consisting of C102, R101 and R102 in the chroma system.

The high-pass filter output is fed to correlator IC101(CX-22013) through amplifier Q101.

Signals are fed to IC101 through pins 8 through 10 and the output of IC101, which appears at pin 7, is fed to delay line DL101. The 113ns (one-half wavelength at 4.43MHz) delayed signal appears at pin 3 and the 226ns (full wavelength at 4.43MHz) delayed signal appears at pin 4. Two delayed signals and one non-delayed signal are fed to correlator IC101 to obtain the correlation function. Pin 12 of IC101 outputs the chroma signal which cross color is suppressed. The gain of the correlator is 0dB.



Y/C SEPARATOR CIRCUIT

The correlator output signal is fed to the edge corrector circuit consisting of an analog OR circuit. This circuit compares the main channel chroma signal, its one-half wavelength advanced signal and its one-half wavelength delayed signal to reproduce a one-half wavelength chroma signal at the chroma signal's edge.

The one-half and full wavelength delayed signals at 4.43MHz are generated by delay line DL201. The one-half delayed signal is inverted by Q203.

The analog OR circuit, edge corrector, is composed of transistors Q205 through Q212.

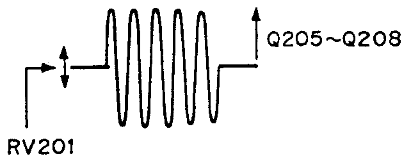
Transistors Q205 through Q207 are used to constitute an OR circuit for the upper half of the chroma signal waveform.

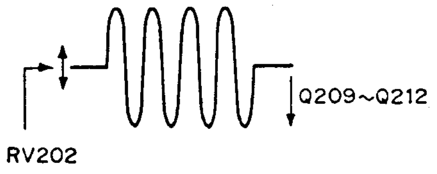
Transistors Q209 through Q211 are used to constitute an OR circuit for the lower half of the chroma signal waveform.

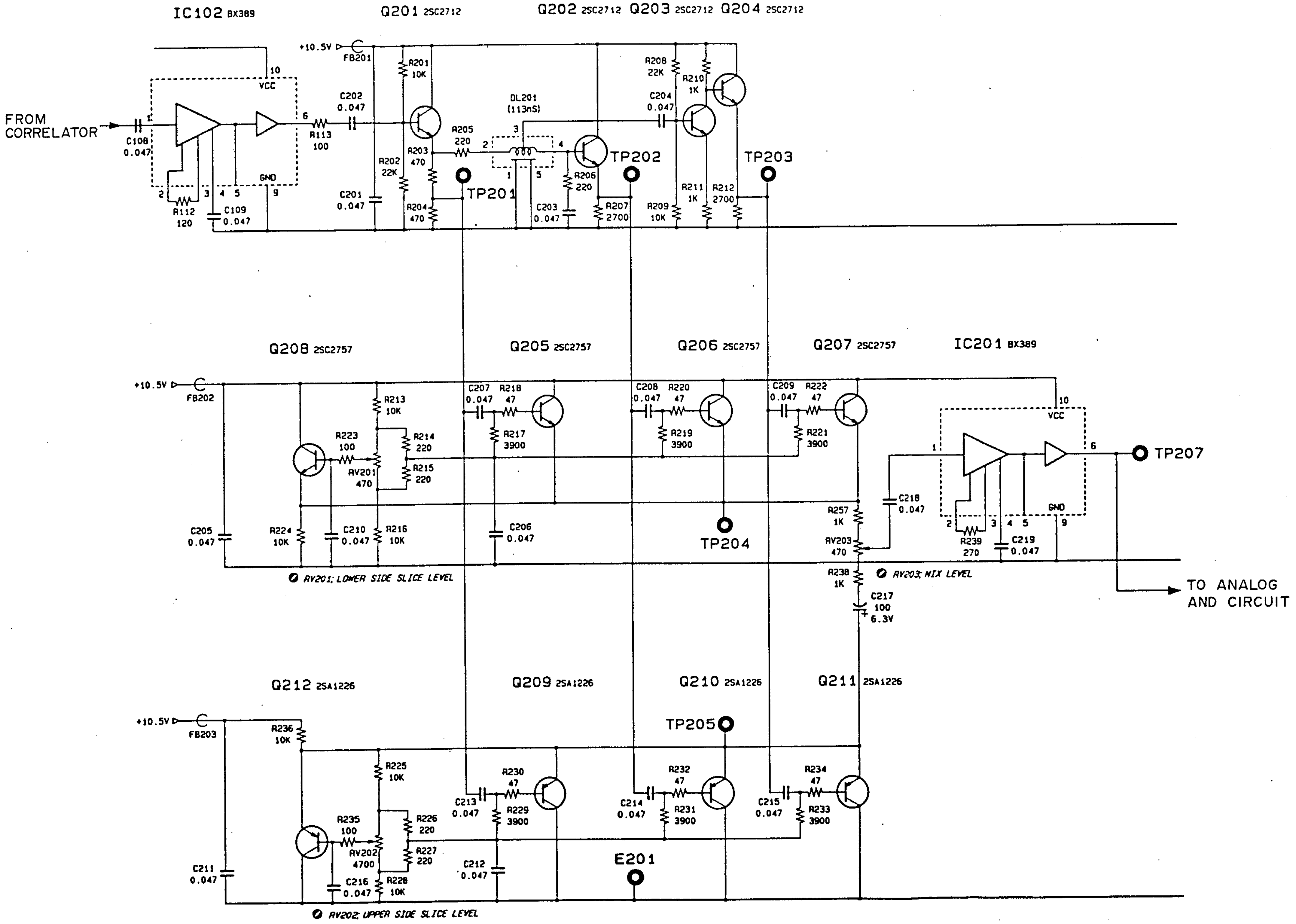
RV201 and RV202 determine the reference level for upper and lower half waveform.

Transistors Q208 and Q212 are used to define the reference levels for the upper and lower halves of the chroma signal, respectively.

The respective OR circuit outputs are mixed together by the resistive network and the upper and lower halves are balanced by RV203.





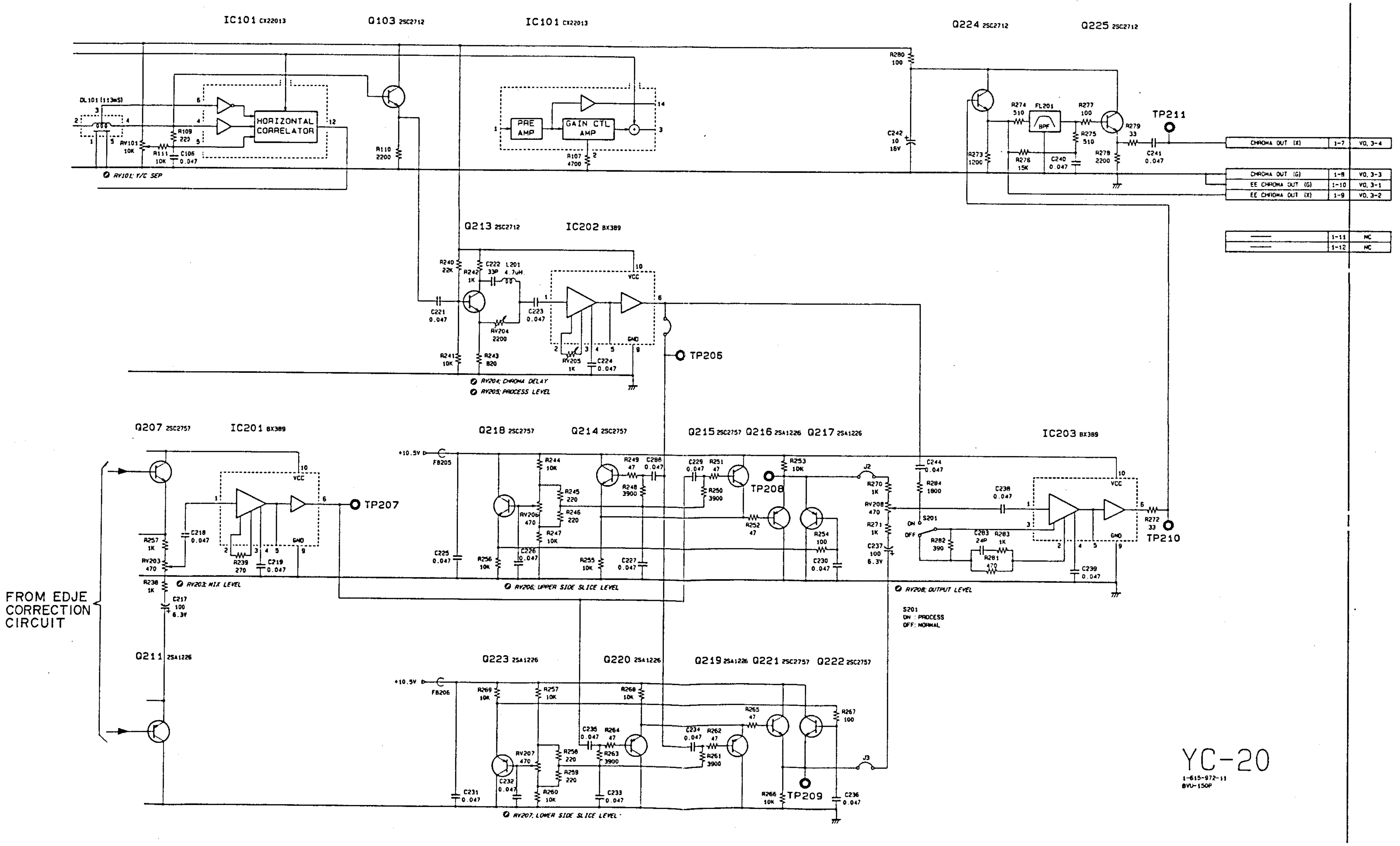


EDJE CORRECTION CIRCUIT

The chroma signal is fed from the edge corrector to the analog AND circuit consisting of Q214, Q215, Q216, Q219, Q220 and Q221. The edge corrector output is compared to the correlator input signal passing through delay circuit Q213 and amplifier IC202 to obtain the edge-corrected chroma signal. This chroma signal is divided into an upper half and lower half. The low-level signals from both chroma signal halves are output. Q219 through Q221 function as an AND circuit for the upper half of the chroma signal, and Q214 through Q216 as an AND circuit for the lower half of the chroma signal. The threshold levels for dissecting the upper and lower halves are determined by RV206 and RV207, respectively. Thereafter, the upper and lower halves of the chroma signal are balanced and mixed by RV208. This mixed signal is amplified with amplifier IC203. Switch S201 is turned off in the normal state. For picture frames in which only several cycles of the chroma signal are contained in the horizontal direction, the horizontal correlator regards these as frames of no correlation. Therefore, the colors of these frames are faded under some conditions. When switch S201 is turned on, correct level of the chroma siganl is output but the cross color is more reworkable than this switch is set to off position.

The signal appearing at TP210 passes a buffer Q224 and separates into two routes.

The chroma signal fed from Q224 is sent to the VO-12 board after passing, as a REC chroma signal, through a BPf. Moreover, the EE chroma signal is also sent to the VO-12 board but does not pass through the BPF.



3-7. REC Amplifier Circuit (on RP-24 Board)

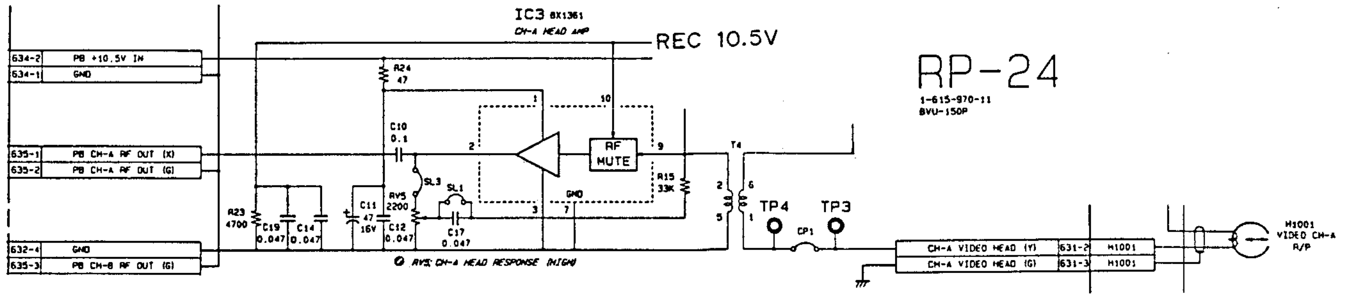
The Y-RF and C-RF signals at approximately 0.8 Vp-p and 0.5Vp-p are fed to pin 3 of connector CN632 and pin 1 of connector CN633, respectively. The recording levels for these signals are respectively controlled by RV1 and RV2.
These signals are mixed together with IC1 (BX-373), and the resultant signal is amplified using IC2 (BX-374).

The REC amplifier has the same configuration as that used in conventional BVU-110Ps except that the high frequency response in the transmission system has been improved by new transformers T1 through T3.

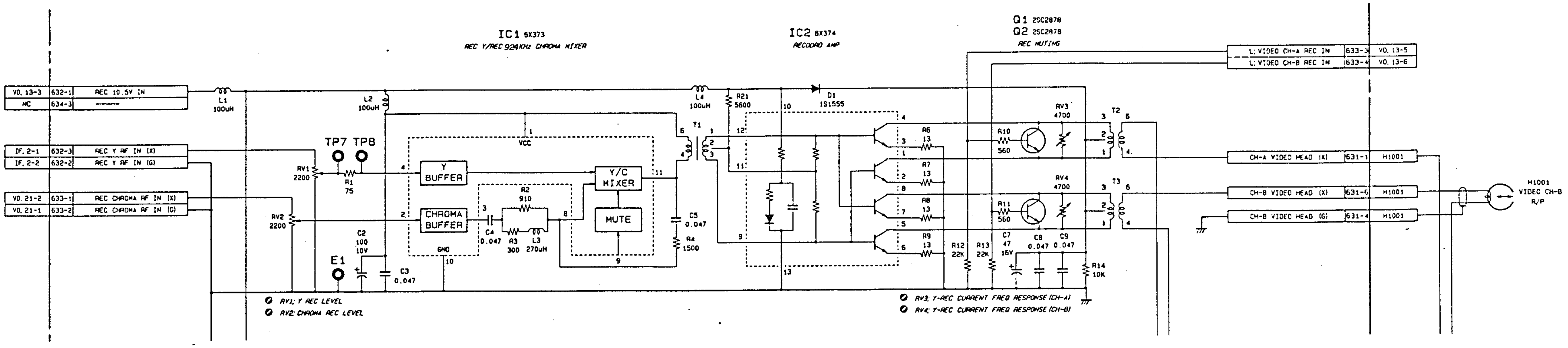
3-8. PB Amplifier Circuit (on RP-24 Board)

The PB head amplifier (IC3 and IC4) employs a new IC BX-1361.

The BX-1361 has no resonator at the input part. It also has a flat response over the high frequency range. The frequency response of the electromagnetic conversion system occurs during head amplifier output.



⊘ RV5; CH-A HEAD RESPONSE (HIGH)



⊘ RV1; Y REC LEVEL
⊘ RV2; CHROMA REC LEVEL

⊘ RV3; Y-REC CURRENT FREQ RESPONSE (CH-A)
⊘ RV4; Y-REC CURRENT FREQ RESPONSE (CH-B)

3-9. PB Amplifier Circuit (on VO-12 Board)

The PB RF signals of channels A and B are fed from the RP-24 board to pins 4 and 6 of CN21 on the VO-12 board, respectively.

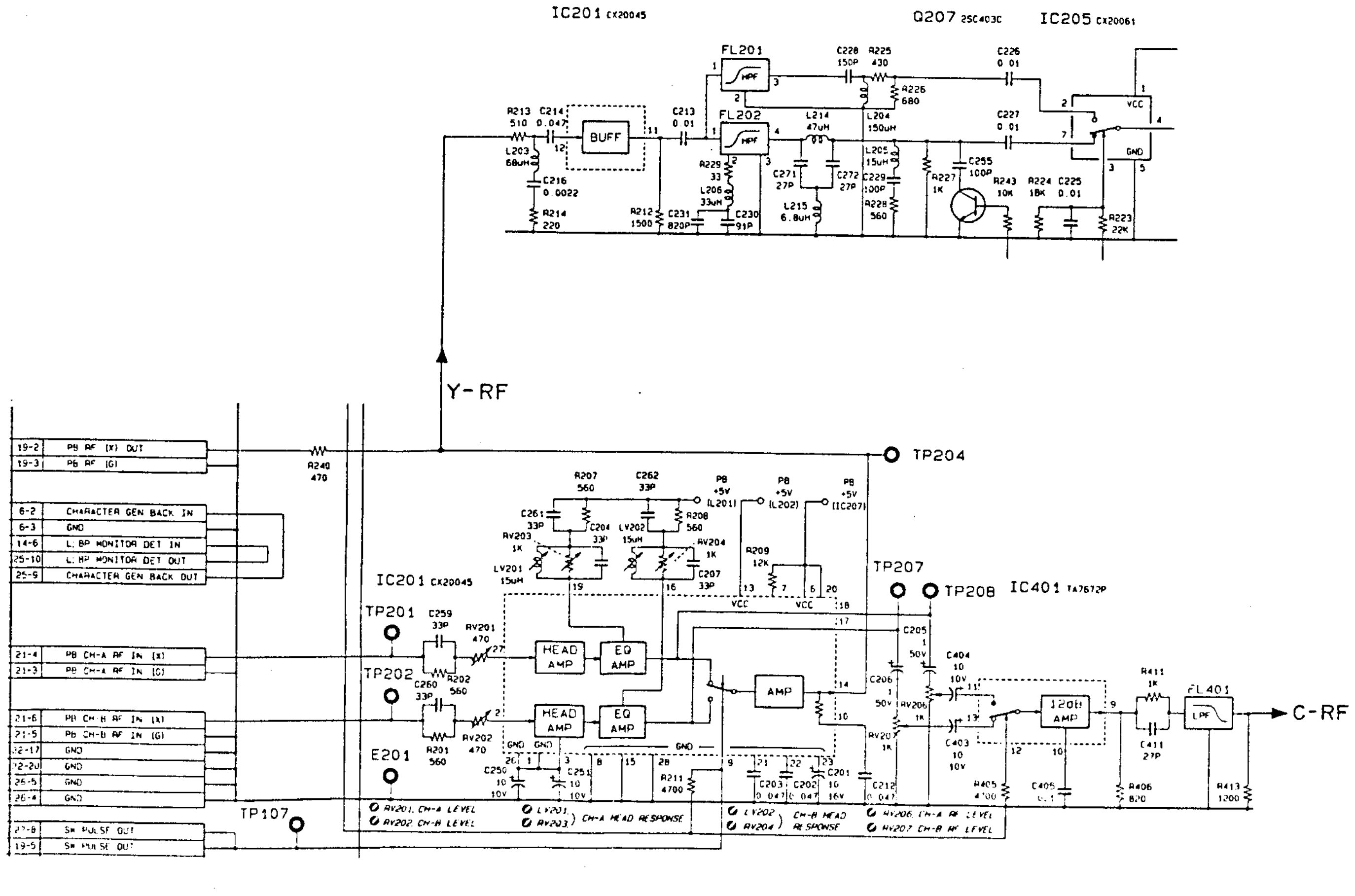
These signals are fed through pins 27 and 2 of CX-20045 IC201 to the emitters of the base-groundded amplifiers in IC201. The signal levels of channels A and B can separately be controlled by emitter resistors RV201 and RV202, respectively.

The BVU-150P provides no interchannel balancer and adjusters RV201 and RV202 are used to balance channels A and B at TP204. The Y and chroma channels are separated and the chroma RF signals occurring at pins 17 and 18 of IC201 are fed to pins 13 and 11 of IC401, respectively.

The Y signal fed from the base-grounded amplifier passes through equalizer amplifier. Resonators LV201 and LV202 tune the 8.5MHz frequency and are connected to pins 19 and 16 of IC201,respectively. RV203 and RV204 are used to dump peaking at resonation frequencies.

The signal voltage occurs at pin 14 of IC201. When an input voltage of 50mVp-p is fed to pins 27 and 2 of IC201, an output voltage of approximately 1.2 Vp-p occurs at pin 14 of IC201.
The Y-RF signal is fed from TP204 to buffer IC201 through L203, C216 and R214 which comprise a low-frequency trap. The buffer output signal is fed to HPFs FL201 and FL202 for use in the SP and conventional modes, respectively. Each HPF can effectively eliminate the low frequency component of the chroma bandwidth.

An LPF with a cutoff frequency of 10MHz is incorporated into the next stage to eliminate overmodulation.



3-10. PB HF Circuit

The frequency-equalized RF signal is sent to PB HF circuit IC204 to prevent overmodulation.

The basic idea behind the PB HF circuit is to amplify the high-frequency RF signal without group delay.

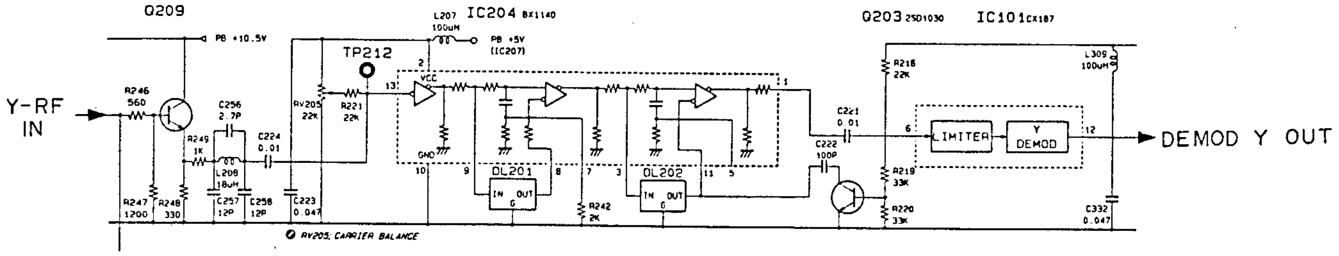
Overmodulation at limiter output is prevented by amplifying low level high-frequency RF signals having no phase distortion.

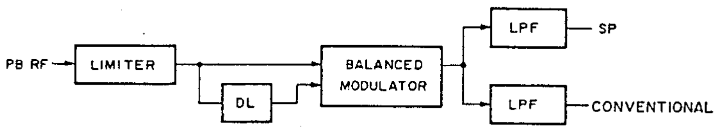
3-11. Demodulator

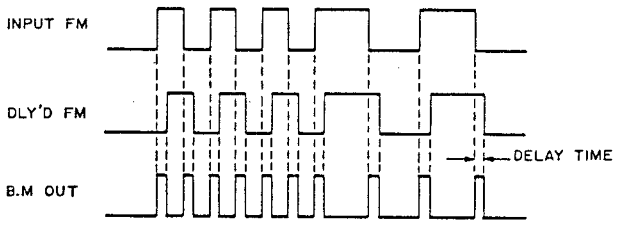
The RF signal is fed from the PB HF circuit to pin 6 of IC101 CX-187, and then it is fed to the balanced modulator through the hard limiter.

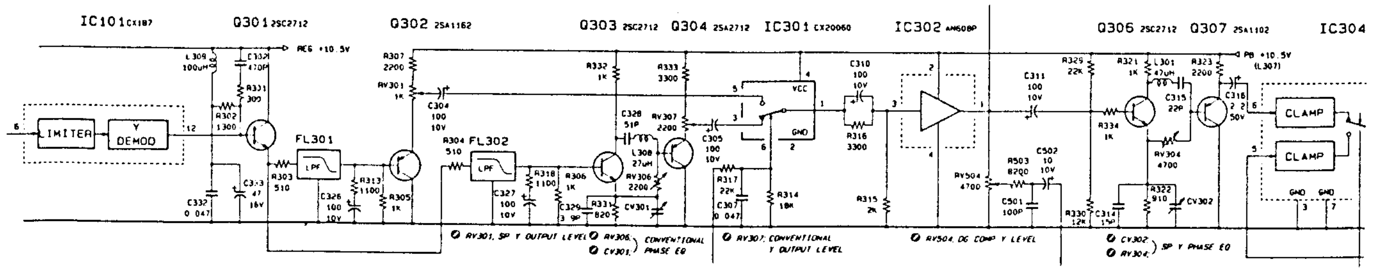
The demodulated Y signal passes through the de-emphasis circuit composed of R302, C302 and R301, to LPF FL301 in the SP mode or to LPF FL302 in the conventional mode. These LPFs incorporate a phase equalizer. The Y signal is fed to Q303 and Q304 which comprise a phase equalizer during the conventional mode. Q306 and Q307 comprise a phase equalizer in the SP mode. The phase equalizers Q303, Q304, Q306 and Q307 compensate for the Y phase response disordered by the noise canceller. IC301 is used to select either the SP or conventional mode. IC302 is an amplifier with a gain of approximately 20dB.

First adjust the phase response in the SP mode, and then that of the conventional mode.









3-12. DOC Circuit

The video dropout compensation circuit, used in BVU-150P, is used to delay the video signal by a time of 1H.

The Y signal is fed to pin 6 of IC304 and the main or 1H-delayed Y signal is selected by using the RF dropout pulse detected by IC401.

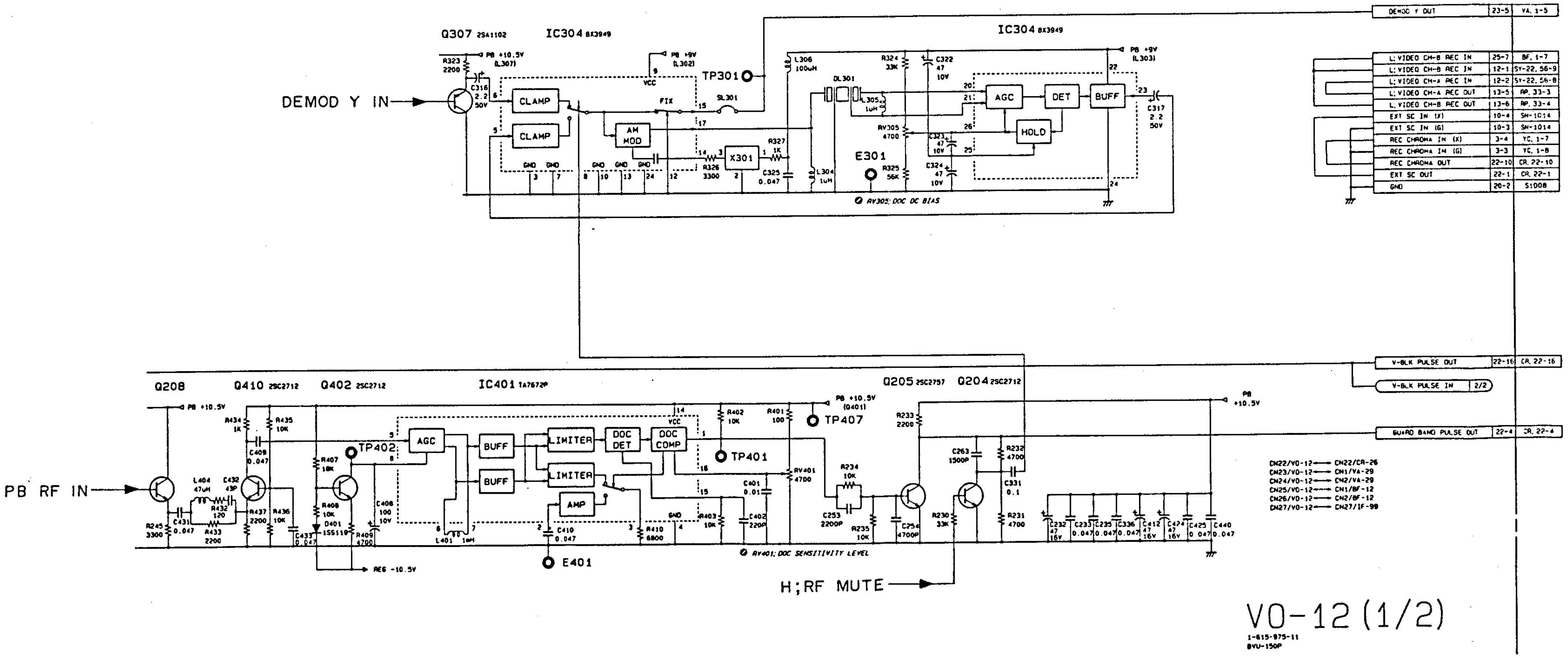
The Y signal is delayed by 1H delay line DL301 which is made of glass.

The passing bandwidth of the glass delay line is not matched with that of the Y signal. Further, the video signal is amplitude-modulated by the carrier at a frequency of 3fsc or 13.3 MHz.

The AM signal is delayed by 1H with delay line DL301 and this delayed AM signal is fed to pin 20 of IC304 to realize AGC. RV305 is used to determine the gain of the AGC amplifier.

The delayed signal amplitude is set to equal the nondelayed signal amplitude using RV305. Thereafter, the delayed signal is demodulated by using IC304. IC401 detects dropout in the RF signal and the dropout pulse is reshaped by Q205.

The RF signal frequency response is compensated by using Q208 and Q410 which comprise an amplifier and is fed to pin 5 IC401. Transistor Q402, consisting a of stable current circuit, is used to control the RF AGC amplifier gain in IC401. The dropout detection level is determined by RV401. After the dropout is compensated, the Y signal is sent to the VA-29 board through TP301.



3-13. Noise Canceller (on the VA-29 Board)

The demodulated and phase-equalized video signal is sent to the noise canceller on the VA-29 board. This noise canceller is composed of an HF de-emphasis circuit (noise canceller) consisting of IC1, Q9, Q10 and Q11, and a noise canceller consisting of IC2, Q14 and Q15.

The demodulated and phased-equalized video signal branches into two routes: one is directly sent to buffer Q1 and the other is sent to amplifier Q9 to extract noise and HF preemphasized component. The signal inverted and amplified using Q9 is input to limiter IC1 through a high-pass filter consisting of R21 and L3. The output of IC1 is fed to pin 4, with the same phase as the signal appearing at pin 1, and passed through R26,RV1, and C12. The resultant signal is mixed with the video signal, passing through Q1 and R3, by base-groundedamplifier Q2. Thisnoise canceller performs HF de-emphasis by mixing the limiter output with the video signal, eliminating a subtle signal passed through the limiter as noise from the video signal. RV1 is set by adjusting the gain so that the HF preemphasis is HF de-emphasized. Moreover, when a sweep signal with an amplitude of 20mVp-p is input at the base of Q9, a 2MHz signal disappears at the collector of Q2 (at TP4).

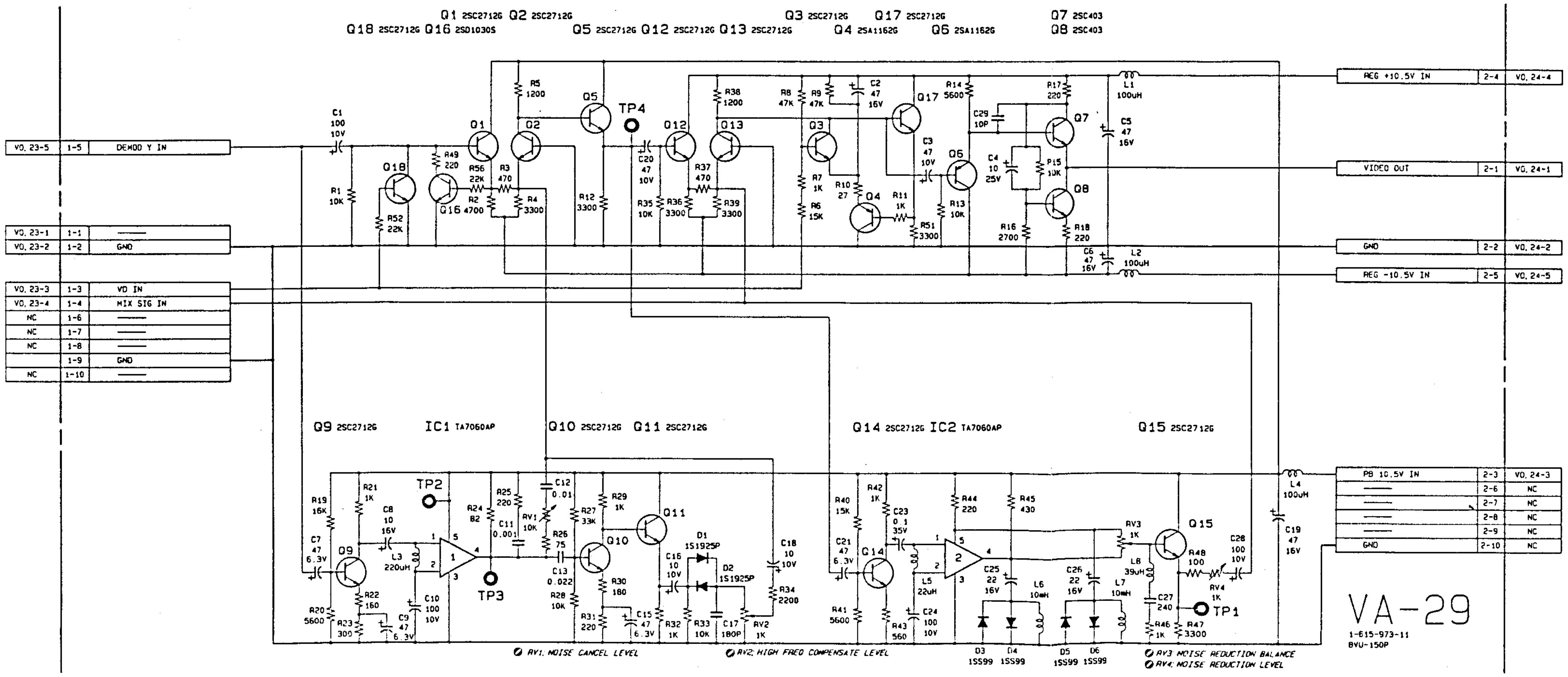
The output from pin 4 of IC1 is inverted and amplified using Q10 and passed through buffer Q11. As a result, only the edge signal is extracted using slicers D1 and D2 and gain is adjusted using RV2. Then, the signal is passed through R34 and C18 and mixed with the video signal by base-grounded amplifier Q2. This mixed signal compensates for the edge portion of the signal.

The output of Q2 is passed through buffer Q5 and amplified using Q14 to extract noise. The resultant signal is sent through a high-pass filter, consisting of R42 and L5, to limiter IC2. The output of IC2 is sent to pin 4 in phase with the signal appearing at pin 1 and sent to pin 5 out of phase with the signal at pin 1. The output signals are fed to diode limiters consisting of D3 and D4, and D5 and D6. The output at pin 4 is about 6dB higher than that at pin 5. The output signals at pins 4 and 5 of IC2 are mixed using RV3. When the small-amplitude signal passed through the diode limiters is input, adjust RV3 so that the signal level at the base of Q15 is minimized. When the resultant signal is mixed with the video signal, waveform inferior less noise cancelling at the edge portion can be performed. The signal phase input to the base of Q15 is adjusted in phase with the video signal using L8, C27, and R46, and it is passed through buffer Q15. Then, the signal is mixed with the video signal passing through Q12 and R37 by base-grounded amplifier Q13 after it is passed through R48, RV4, and C28.

3-14. Video Output Circuit

As described previously, the noise-cancelled video signal is output to the collector of base-grounded amplifier Q13. Moreover, Q13 mixes the chroma signal in the PB mode and the EE signal in the EE mode. For EE signal mixing level adjustment, the Y level is adjusted using RV111 on the VO-12 board, and the chroma level using RV51 on the VO-12 board. The chroma level in the PB mode is adjusted using RV502 on the VO-12 board. The signal appearing at the collector of base-grounded amplifier Q13 is fed to buffer Q6 as a video signal and is sent to the VO-12 board at low impedance by using a shunt regulator consisting of Q7 and Q8. Then, the sigal branches into two routes for output: one is passed through R54, and the other, R55 on tne VO-12 board.

A muting circuit consisting of Q3, Q4, and Q17 on the VA-29 board is also connected to the collector of Q13. The output of Q13 collector is fed to emitter follower Q17 and dropped in voltage by VBE using emitter follower Q4. In other words, the potential of Q4 emitter becomes the same as that of Q17 base. The potential of Q3 emitter is held to the potential of the sync tip by using a peak detector consisiting of R9, R10, and C2. When a muting pulse is input to the base of Q3, a current flows between the collector and emitter of Q3 and the video signal is muted at the potential of the sync tip.



4. CHROMINANCE PROCESSING

4-1. ACC, APC and AFC Circuits (on CR-26 Board)

The chroma signal in the REC system is processed by IC1 CX-859 and IC2 CX-872 on the CR-26 board.

4-1-1. REC Mode

The ACC, APC, AFC loops and pilot burst insertion circuit of the chroma circuit are provided during the REC mode.

The chroma signal in the REC mode is first fed to the ACC amplifier in IC2 to suppress signal level fluctuation.

The ACC error is obtained by comparing the burst signal with the reference signal. This is done to realize phase detection in the ACC loop. The reference signal is to be locked to the input burst signal. This is done to establish an APC loop.

The APC loop which establishes ACC in the REC mode is described below.

ACC and APC loops

The reference signal is generated by internal reference oscillator X1 at 4.43 MHz, and the oscillator output signal is fed to tuning circuit T1 which has a resonating frequency of 4.43 MHz. It is then fed to L3 and C28 which comprise a 90-degree phase shifter. This phase shifter's output signal is fed to the APC detector through pin 15 of IC2.

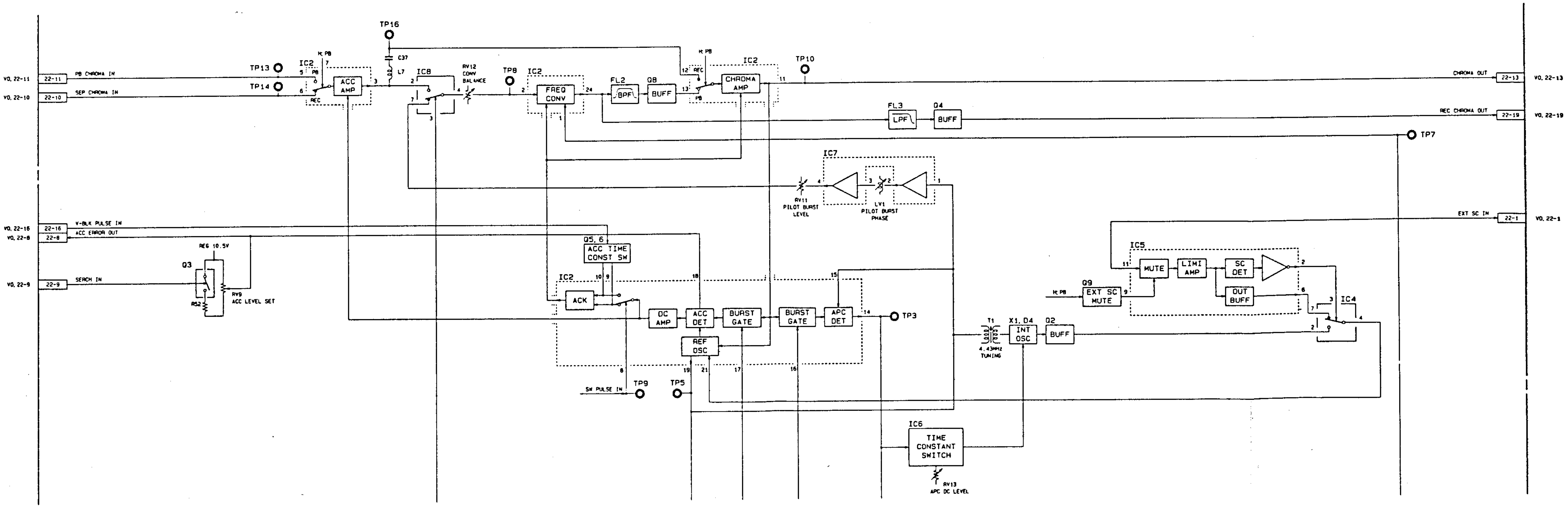
The burst signal obtained from the input chroma signal passing through the burst gate is fed to the APC detector. Further the phase error occurs at pin 14 of IC2.

The APC error is fed through pin 14 of IC6 to the switch which is set at pin 12 during the REC mode. This signal is then fed through the CR time constant circuit to D4, which comprise the variable capacitance circuit.

This enables the oscillator output signal to be locked by the input burst signal to establish an APC loop. RV13 is used to adjust the frequency of the reference oscillator in the REC mode so that it equals that in the PB mode.

The APC-locked reference signal at 4.43 MHz and the input burst signal are multiplied by using the ACC detector so that the burst signal level or an ACC error can be detected.

After stabilizing the chroma level using the ACC amplifier, a pilot burst signal is inserted to the chroma signal by switch IC8 on the CR-26 board. The pilot burst phase is adjusted by LV1 to the -U axis of the chroma signal and the pilot burst level is adjusted by RV1 to the 75% chroma level.



AFC loop

The chroma signal is fed from the ACC amplifier to the frequency converter in IC2. The frequency converter converts the 4.43 MHz signal into a 924 kHz signal.

The 4.43 MHz signal locked at input burst signal freuqency by the APC loop and the 924 kHz signal locked at (59 + 1/8)fH, with respect to input signal frequency fH, are added to obtain a 5.35 MHz carrier signal used for frequency conversion.

The Y signal is fed through delay line DL1 and switch IC6 to pin 22 of IC1 CX-859 on the CR-26 board.

This signal is then fed to the sync separator in IC1 and rejects the 1/2 H signal component. Further, the horizontal sync signal is fed to the sample/hold circuit.

The output signal of the VCO (operating at (59 + 1/8)fH x 8 = 473 fH) is divided by a factor of 473. After this, the sawtooth wave signal is generated by using the sawtooth wave signal generator. This sawtooth wave signal is sampled by the horizontal sync signal and is stored using C7 and C9.

The output signal of the sample/hold circuit is fed back to the VCO to control the oscillation frequency. Further, VCO output signal frequency is locked at fH. The 8 x 924 kHz signal generated by VCO is divided by a factor of 8, and this divided signal is fed to the frequency converter to which the 4.43 MHz reference signal is sent from the oscillator. The output signal of the frequency converter in IC1 passes through BPF FL1 to produce the 5.35 MHz carrier signal. This 5.35 MHz carrier signal is used to convert the 4.43 MHz chroma signal occurring at TP8 into a 924 kHz signal.

The frequency converted chroma signal passes through LPF FL3 which rejects the sum of the 5.35 MHz and 4.43 MHz signals.

The down-converted chroma signal is sent to the RP-24 board through a delay line and low-frequency response compensation circit on the VO-12 board.

4-1-2. PB Mode

The chroma signal in the PB system is fed from TP14 to the IC2 ACC amplifier in the same manner as used in the REC system.

The ACC loop in the PB system is established in the same manner as that in the REC system while the APC loop is established differently.

APC loop

The APC loop in the PB system differs from that in the REC system. That is, the phase variation in the PB chroma signal is eliminated, to firmly establish a color lock on the monitor, by stabilizing the frequency and phase of the PB chroma signal.

The PB chroma signal phase is locked at the phase of the signal generated by the internal 4.43 MHz reference signal generator or the external 4.43 MHz subcarrier signal generator.

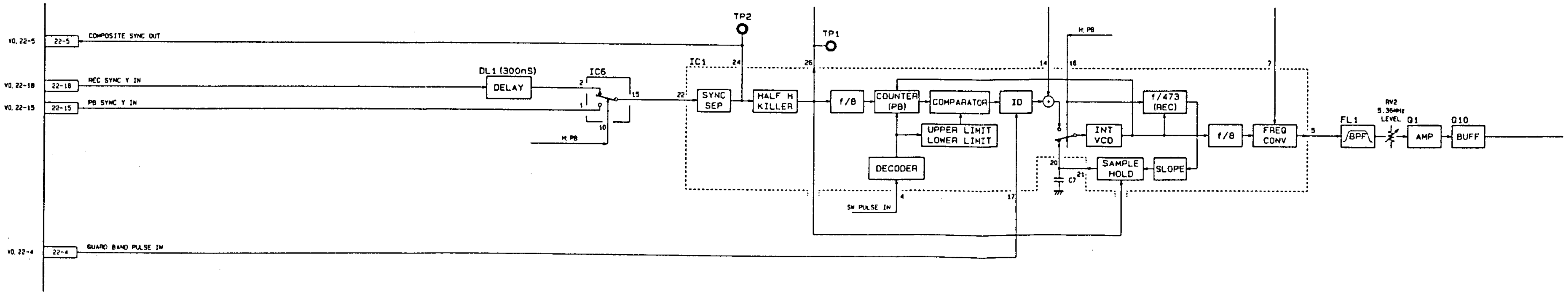
The output signal of internal reference oscillator X1 is fed to switch IC4 through buffer Q2. When the external subcarrier signal is fed from the external SC IN connector it is detected in IC5 and switch IC4 is automatically set at the external subcarrier position. Then, the VCO in IC2 is locked at the external subcarrier signal, in place of the internal reference signal.

The oscillator output signal is fed to the APC detector through the 90-degree phase shift circuit.

In the PB mode, the phase of the pilot burst signal which is obtained by gating the chroma signal is compared with that of the reference signal. The APC error at TP3 is fed to switch IC6 which selects pin 13 of IC6 in the PB mode. Moreover, the CR time constant circuit connected to pin 13 of IC6 is used to determine the APC loop gain. Thus, the VCO in IC1 is directly controlled by the APC error during the PB mode.

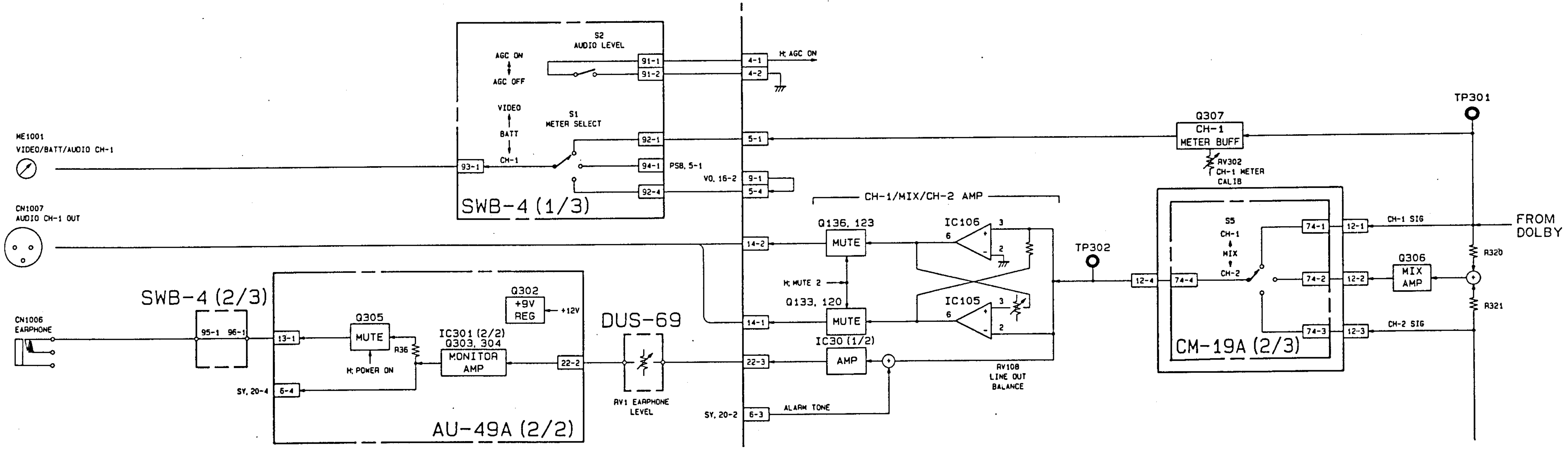
RV1 is used to set the VCO frequency at 473 fH. The VCO output signal at 473 fH is divided by a factor of 8. The output signal of this x 1/8 counter is fed to the frequency converter together with the external subcarrier or internal 4.43 MHz signal to generate the 5.35 MHz carrier signal.

The stable 4.43 MHz chroma signal can be generated by the frequency converter to convert the 924kHz PB chroma signal having the 5.35MHz carrier signal.



Next, this signal is sent to CH-1 meter buffer Q307 and CH-1/CH-2 mix buffer Q306. The LINE OUT signal in channel 1 is fed from connector CN18-1 to CN12-1 and sent to the CH-1/MIX/CH-2 select switch S5 on the CM-19 board.

The selected signal using the select switch is sent to connector CN12-4, after which it is amplified by approximately 9dB using CH-1 output amplifiers IC105 and IC106. At this point, the output level is +4dB.



4. RECORDING SYSTEM (CM-19/AU-49 BOARD)

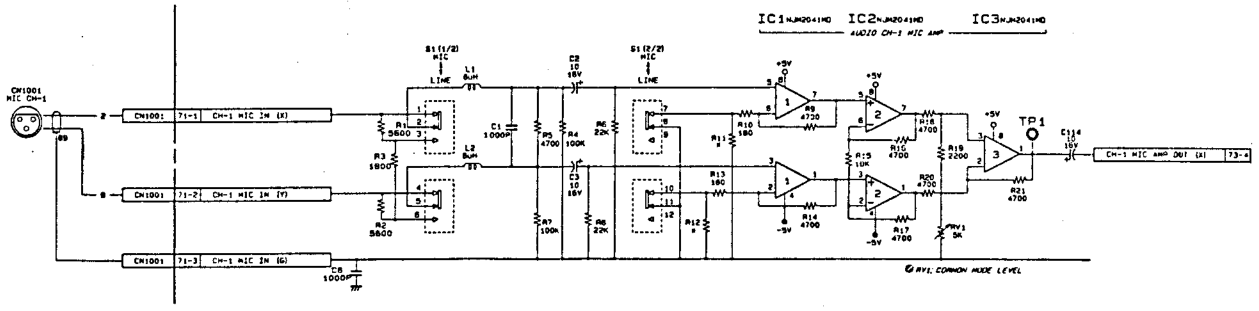
4-1. MIC AMP (CM-19A Board)

The audio recording signal is fed from the AUDIO IN connector and sent to the CM-19 board. A -60dBm MIC input and +4dBm LINE input are provided for CH-1 input. Since the MIC and LINE inputs differ in level, an attenuator consisting of R1, R2 and R3 is inserted. Attenuator selection is performed using switch S1 (1/2). The signal passing through switch S1 (1/2) is fed to a CH-1 MIC amplifier consisting of IC1, IC2 and IC3. The signal fed to pins 3 and 5 of amplifier IC1 in the first stage is amplified by approximately 30dB during MIC input and sent to pin 1 (pin 7) of IC1. Output from pin 1 of IC1 is input to amplifiers consisting of IC2 and IC3 in the next stage. IC2 and IC3 constitute a CMRR (Common Mode Rejection Ratio) circuit. The CMRR circuit is designed to output no in-phase signal so as to prevent humming from occurring during balanced input. This circuit has the same function as a transformer. Moreover, by using the CMRR circuit, amplification can be performed and the frequency response band can be expanded. The circuit in CH-2 is also identically configured with that in CH-1 except that MIC input is supplied from a camera.

Audio input from a camera is supplied using a 14-pin camera cable and fed from pins 1 and 2 of connector CN75 to the CM-19A board.

A -60dB or -20dB camera MIC input level is provided by the selection of switch S2. The attenuator consists of R51, R52 and R53. In addition to the -60dB input level, the camera input level of -20dB has been provided so that the BVP-150P color video camera having a reference input level of -20dB can also be used.

The signal passing through the CMRR circuit is fed from pin 5 of connector CN73 and output to the AU-49 board.



4-2. LINE/AGC AMP (AU-49 Board)

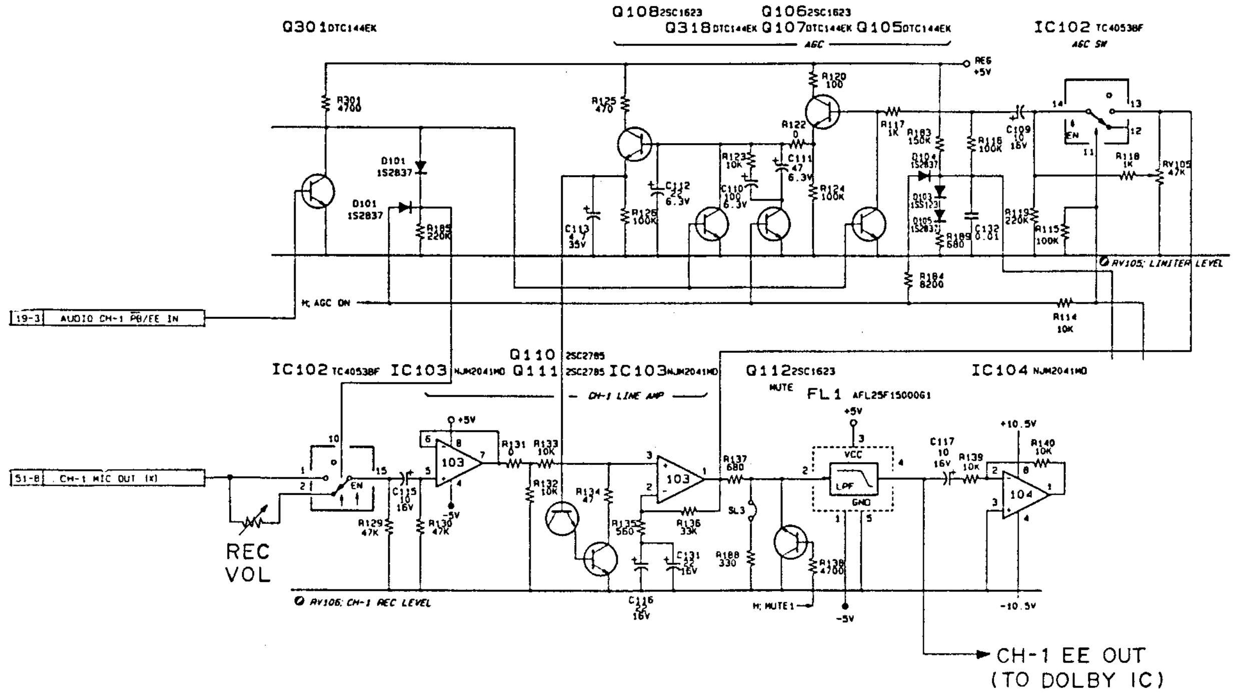
The audio signal fed from the CM-19A board is sent to pin 1 of connector CN10 on the AU-49A board. It is then fed through switch IC102 to the LINE/AGC circuit.

The AGC circuit is operated when the audio level switch is set to AUTO in the REC mode. When the audio level switch is set to MANUAL, the circuit functions as a limiter. The AUTO/MANUAL setting of this AGC circuit is controlled by an AGC ON/OFF signal (at CN4 pin 1) fed from the SWB-4 board and an H: CH-1 EE signal (at CN19 pin 3) fed from the AU-51 board.

This AGC circuit, consisting of Q105 through Q108, Q110 and Q111, generates the DC error of the line amplifier output using Q106 through Q108 and sends it to Q110 and Q111. Then, it changes the attenuation ratio at the input stage of the line amplifier. The attenuator consists of R133 and R134 which are connected to input pin 3 of IC103. This attenuator controls the line amplifier input by controlling the collector current of Q111. Since Q111 is off in the PB mode, output from buffer IC103 is directly input through R131, R132 and R133 to the line amplifier.

C110 and C111 are a double time constant circuit which is inserted into the collector of Q107. They function to suppress the AGC circuit response.

Q110 is activated as a diode and inserted to improve the line amplifier distortion.

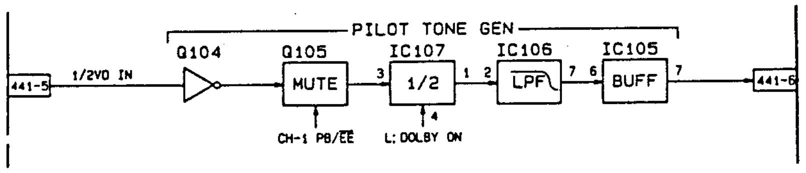


Dolby Encoding (AU-49A and AU-64 Boards)

The LINE/AGC amplifier output is fed to the active low-pass filter FL1 of which cutoff frequency is 17kHz so as to improve the S/N ratio. Then, the resultant signal is fed to the AU-64 board as a CH-1 EE signal.

The input signal is input to pin 7 of Dolby IC IC3 to encode it. The encoded signal is output to pin 10 and passed through high-pass filter IC1 and an amplifier via switch IC9 to ensure the frequency area having the pilot tone signal. Then, the signal is mixed with a pilot tone signal of 12.5Hz using IC5.

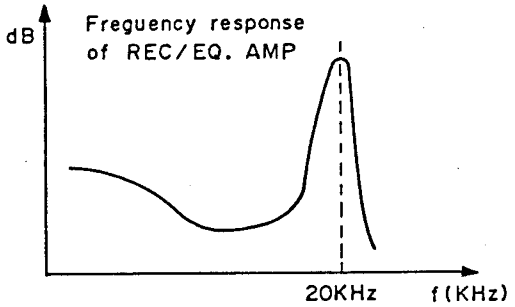
In the EE mode, the LINE OUT signal which is not encoded is output from pin 3 of IC3, and input to pin 3 of IC4, and does not pass through the playback volume and the amplifier.



4-3. REC/EQ AMP (AU-49A Board)

The REC signal level from the AU-64 board is adjusted using RV106, and it is sent through R141 to pin 3 of REC amplifier IC104 (2/2). The frequency response is controlled by C118, R146, R147, C123, C128, LV102, RV107 and R151 when it is recorded on the KSP tape, When recording on a conventional KCS tape, the H: SP signal fed to connector CN9-3 goes low, and Q113 and Q116 are turned on to change the frequency response of the REC equalizer.

Muting switch Q114 which is inserted between the 3-pin input connector of REC amplifier IC104 (2/2) and the ground is used to prevent the REC amplifier from being activated in the PB mode.

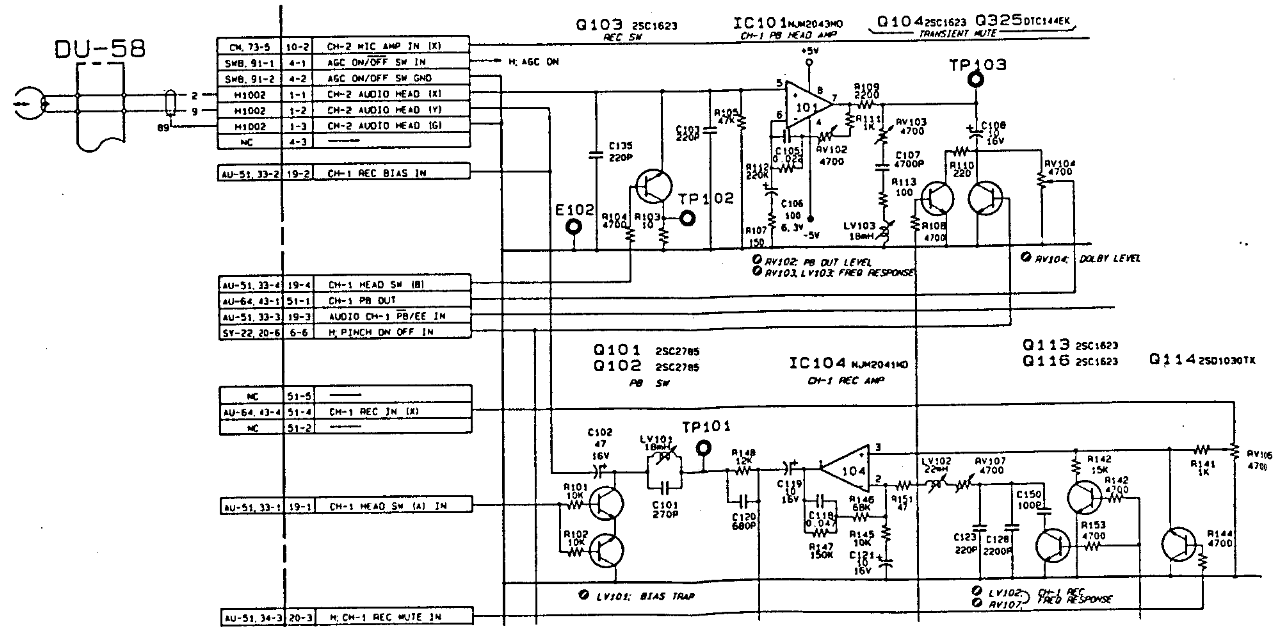


4-4. Crosstalk Canceller (AU-49A Board)

Pin 1 output of CH-1 REC amplifier IC104 (2/2) is sent to the audio head. Moreover, the output is input from TP101 to pin 2 of the negative input terminal of CH-2 PB head amplifier IC101. This circuit consists of a crosstalk canceller.

The BVU-150P has a dubbing mode. In the dubbing mode, the CH-1 audio head is in the REC mode and the CH-2 audio head is in the PB mode. Each audio head of CH-1 and CH-2 is situated closely adjacent to each other. Therefore, the recording signal of CH-1 leaks to the CH-2 playback signal. This crosstalk can be cancelled by feeding the CH-1 recording signal to the minus input terminal of the PB amplifier. The phase of the CH-1 recording signal is adjusted to be same as that of the CH-2 signal and is input.

This crosstalk canceller consists of RV201, C335, R361, R362, Q330, R360, C204, R363 and C240. Crosstalk around 5kHz can be cancelled.


DU-58
CN, 73-5 | 10-2 | CH-2 MIC AMP IN (X)
SWB, 91-1 | 4-1 | AGC ON/OFF SW IN
SWB, 91-2 | 4-2 | AGC ON/OFF SW GND
H1002 | 1-1 | CH-2 AUDIO HEAD (X)
H1002 | 1-2 | CH-2 AUDIO HEAD (Y)
H1002 | 1-3 | CH-2 AUDIO HEAD (G)
NC | 4-3
AU-51, 33-2 | 19-2 | CH-1 REC BIAS IN
AU-51, 33-4 | 19-4 | CH-1 HEAD SW (B)
AU-64, 43-1 | 51-1 | CH-1 PB OUT
AU-51, 33-3 | 19-3 | AUDIO CH-1 PB/EE IN
SY-22, 20-6 | 6-6 | H: PINCH ON OFF IN
NC | 51-5
AU-64, 43-4 | 51-4 | CH-1 REC IN (X)
NC | 51-2
AU-51, 33-1 | 19-1 | CH-1 HEAD SW (A) IN
AU-51, 34-3 | 20-3 | H: CH-1 REC MUTE IN
H: AGC ON
Q103 2SC1623 REC SW
IC101 NJM2043MD CH-1 PB HEAD AMP
Q104 2SC1623 Q325 DTC144EK TRANSIENT MUTE
TP103
TP102
E102
RV102: PB OUT LEVEL
RV103, LV103: FREQ RESPONSE
RV104: DOLBY LEVEL
Q101 2SC2785
Q102 2SC2785
PB SW
IC104 NJM2041MD CH-1 REC AMP
Q113 2SC1623
Q116 2SC1623
Q114 2SD1030TX
TP101
LV101: BIAS TRAP
LV102, RV107: CH-1 REC FREQ RESPONSE

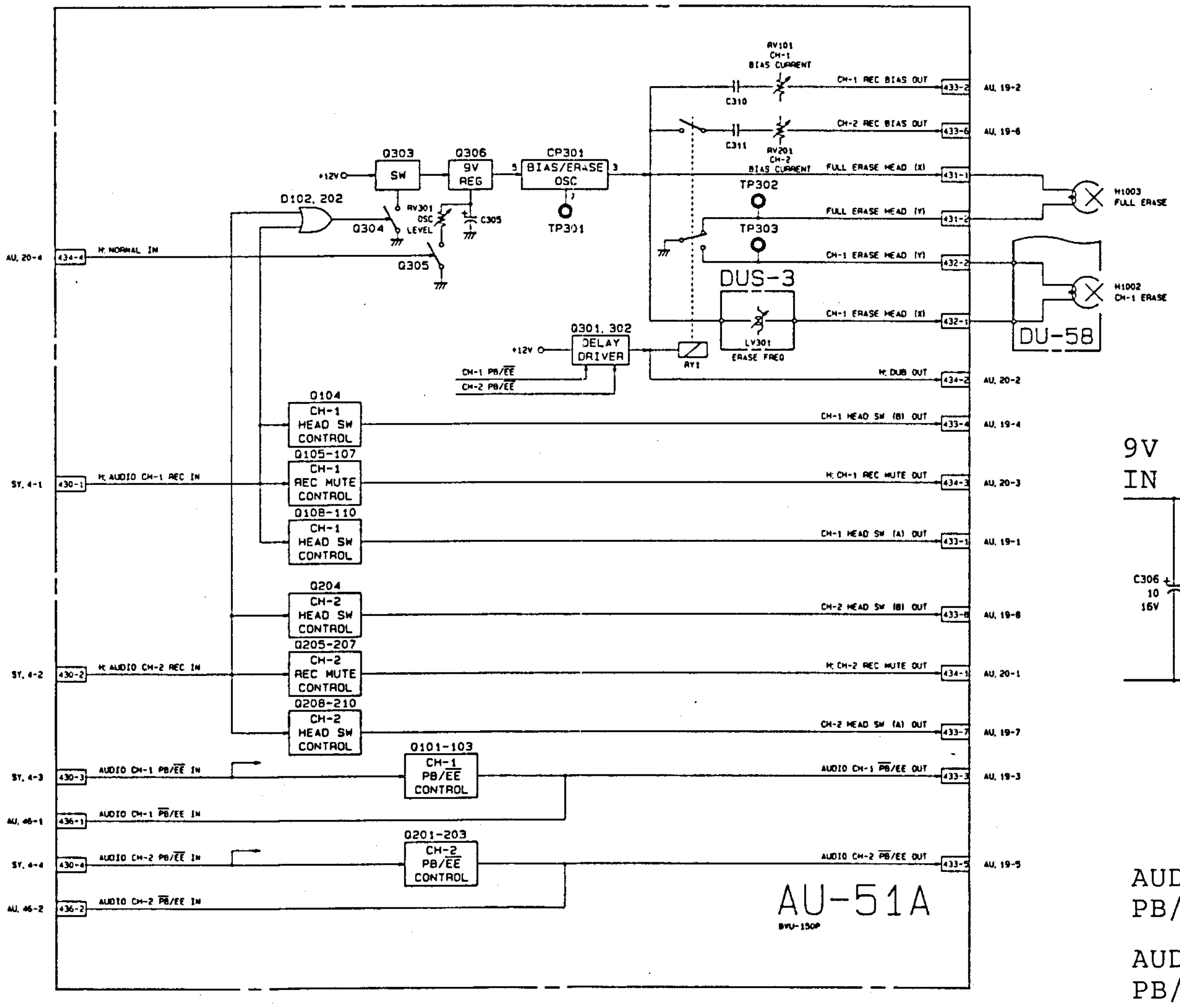
5. CONTROL SYSTEM (AU-51A Board)

The AU-51A board consists of an AU-49A board control circuit, and REC bias and erase current generators.

Since the AU-51A board control circuit in CH-1 and CH-2 is identically configured, only the control circuit in CH-1 will be described here.

REC Bias/Erase Oscillator (AU-51A Board)

H: AUDIO CH-1 REC and H: AUDIO CH-2 REC signals sent from the SY-22 board is fed to an oscillator control circuit consisting of Q303 and Q304.


AU-51A
DUS-3
DU-58
Q303 SW
Q306 9V REG
CP301 BIAS/ERASE OSC
D102, 202
Q304
Q305
TP301
TP302
TP303
Q301, 302 DELAY DRIVER
RY1
LV301 ERASE FREQ
RV101 CH-1 BIAS CURRENT
RV201 CH-2 BIAS CURRENT
H1003 FULL ERASE
H1002 CH-1 ERASE
Q104 CH-1 HEAD SW CONTROL
Q105-107 CH-1 REC MUTE CONTROL
Q108-110 CH-1 HEAD SW CONTROL
Q204 CH-2 HEAD SW CONTROL
Q205-207 CH-2 REC MUTE CONTROL
Q208-210 CH-2 HEAD SW CONTROL
Q101-103 CH-1 PB/EE CONTROL
Q201-203 CH-2 PB/EE CONTROL

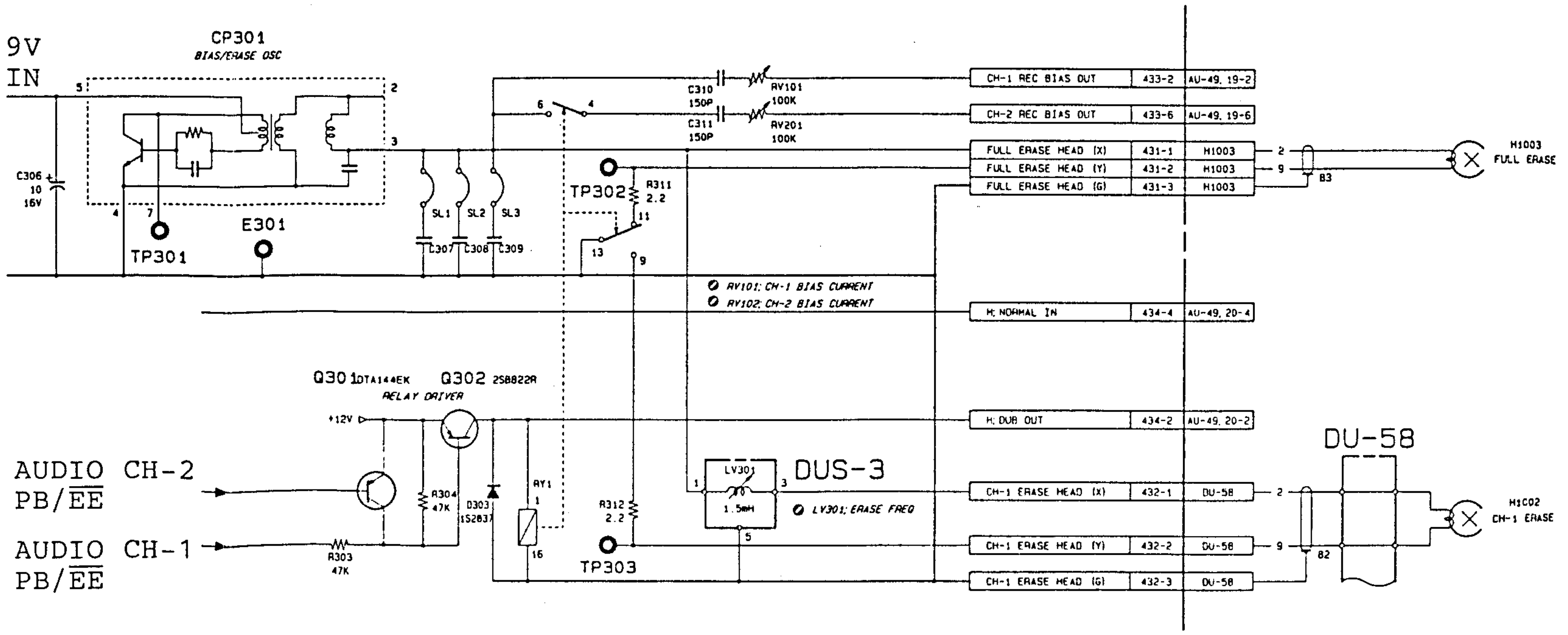
The H: AUDIO CH-1 REC signal fed to connector CN30-1 passes through diode D102 and turns on Q304 and Q303. At this time, power is supplied through 9V-regulator Q306 to oscillator CP301 so as to start oscillation.

D102 and D202 constitute an OR circuit. Therefore, when either of the circuits in CH-1 and CH-2 enters the REC mode, CP301 starts oscillating.

CP301 is a one-chip oscillator. An oscillating output frequency of 71kHz is fed from pin 3 at approximately 150Vp-p. Slits SL1 through SL3 connected to pin 3 is used to adjust the above oscillating output frequency. One output from CP301 is mixed with a CH-1/CH-2 REC bias and an REC AMP output signal on the AU-49 board. However, the bias ON/OFF operation in CH-2 is controlled using relay switch RY-1. The bias is not supplied to CH-2 in the DUB mode. Another output erase frequency from CP301 is controlled by LV301 on the DUS board and fed to the audio erase head of CH-1.

Q301 and Q302 are used to drive relay switch RY-1. Q302 is turned on by H: CH-2 PB signal fed to the base of Q301 and L: CH-1 EE signal fed to the collector of Q301. When Q302 is turned on, +12V is supplied to relay switch RY-1, turning it on. In the DUB mode, RY-1 supplies a bias current to the erase head of CH-1 to stop the feeding of a REC bias signal to CH-2.

When recording on a conventional KCS tape, the oscillator output level from pin 3 of CP301 is controlled by Q305 and RV303.



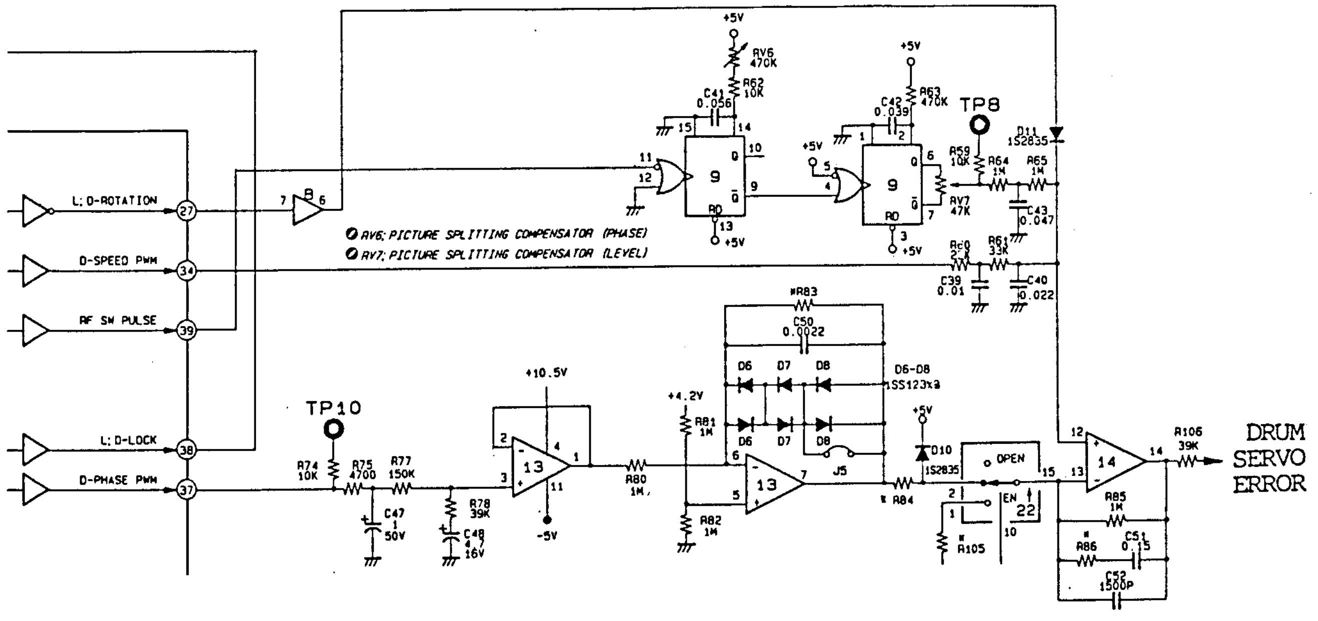
The speed PWM signal is converted to dc voltage by the LPF formed of R60, R61, C39 and C40, and is fed to pin 12 of the differential amplifier IC14. Pin 14 of IC14 outputs the drum speed error which contains the phase error. Pin 27 of IC1 produces the detected signal of the drum rotation or stop. If the drum stops or rotates slower than one-half normal speed, pin 27 of IC1 goes high. If the drum speed increases, the L:DRUM ROTATE signal is output at pin 27 of IC1.

The switching pulse output at pin 39 of IC1 is fed to IC9 to compensate for the picture split. IC9(1/2) and RV6 adjust the phase, and RV7 connected between pin6 and pin7 of IC9 adjusts the level.

This signal is added to the drum speed error loop after passing the LPF (R64 and C43).

- Picture split

When a vertical line is played back on the TV monitor, sometimes one line appears to be split. This is caused by the difference in scanning time between one field and the next. This time error is a kind of jitter and has two possible causes: the error of speed PG and the eccentricity of the drum. The 30(25)Hz jitter synchronized to the drum rotation appears as a split picture on the TV monitor.



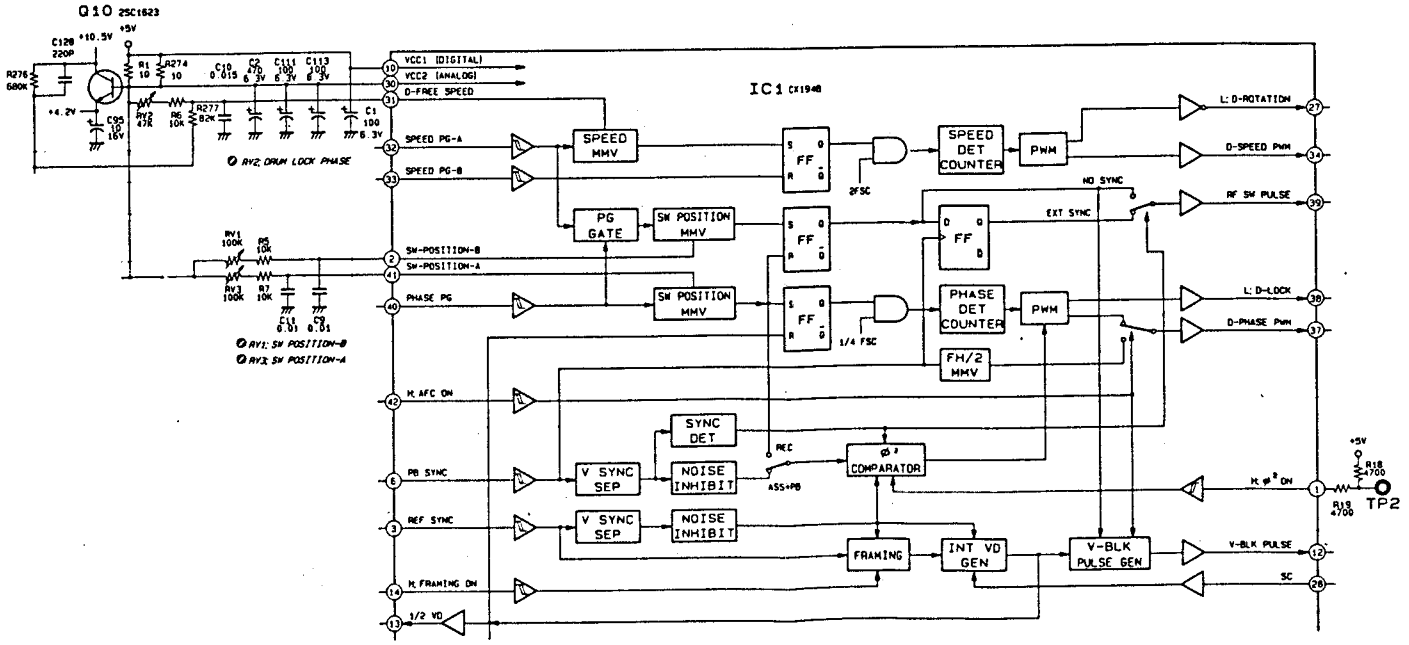
6-1-2. Drum Phase Servo

Using the phase PG, speed PG(A) located 180 away is extracted, delayed to the switching timing and used as the switching pulse. The phase PG is compared with the 1/2 VD made up of the internal oscillator and the REF SYNC, and the phase error is detected.

First of all, we'll discuss the switching pulse generator.

The phase PG input to pin 40 of IC1 is reshaped and supplied to two routes. One triggers the SW POSITION monostable multivibrator and is delayed to the switching position. The time constant RV3 and C11 connected to pin 41 of IC1 determines the delay amount. This output resets the SW PULSE generator R-S flip-flop (2), and sets the phase detector R-S flip-flop (3). The other reshaped phase PG is fed to the PG gate where it detects the 180 pulse from the eight-speed PG pulses. This pulse triggers the SW POSITION monostable multivibrator. This time constant RV1 and C9 delays the pulse to the switching position. This output sets the R-S flip-flop (2) and the delayed phase PG resets the R-S flip-flop (2). In this manner, the switching pulse is produced. The RF SW pulse is locked to H-SYNC by the D-type flip-flop triggered by the PB SYNC. But, when no PB SYNC is present, the RF SW pulse is directly output from the R-S flip-flop (2).

The following explains the operation of the phase servo. The delayed phase PG sets the R-S flip-flop (3), which is then reset by 1/2 VD made up of the REF SYNC in CX-194. The output Q of the flip-flop (3) opens the AND gate, which lets the 3.58(4.43)MHz/4 clock out during the period of Q "H". The gated clocks are counted by the PHASE DET COUNTER whose data is sent to the PWM counter which produces a PWM signal proportional to the phase error at pin 37 of IC1. The drum phase PWM output at pin 37 of IC1 is supplied to two routes. One goes to pin 3 of IC13 (phase servo loop). The other goes to pin 13 of IC22 (AFC servo loop). R77, R78 and C48 compensate the phase of the phase servo loop so that the time needed to pull in the state of the phase lock is shortened and jitter is also reduced.

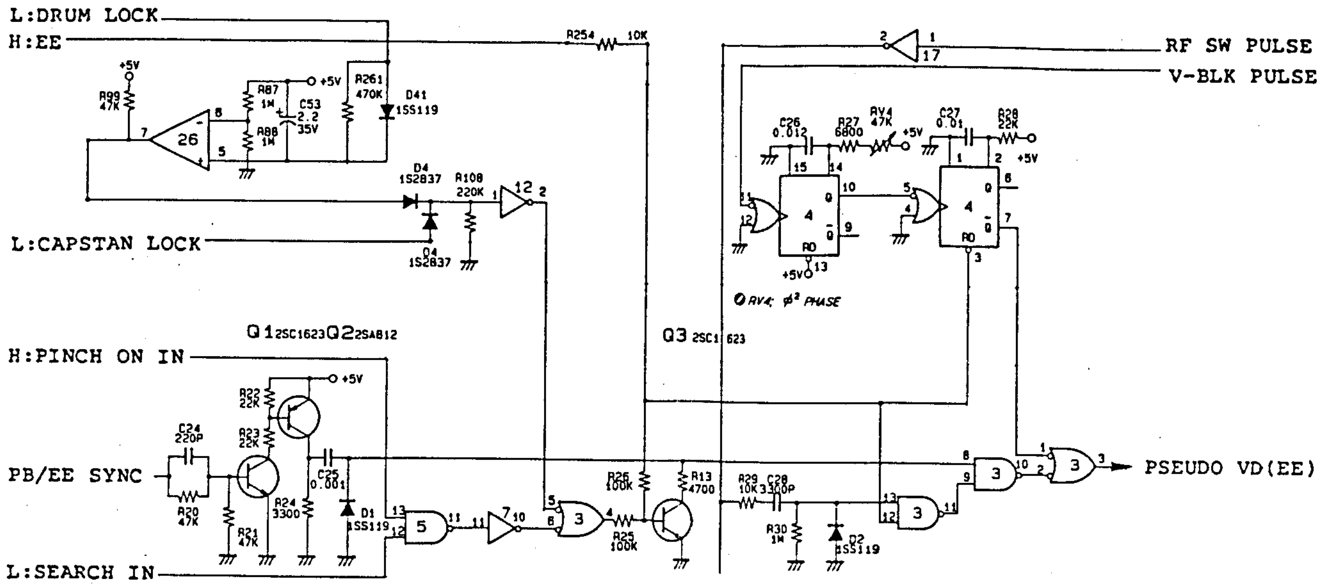


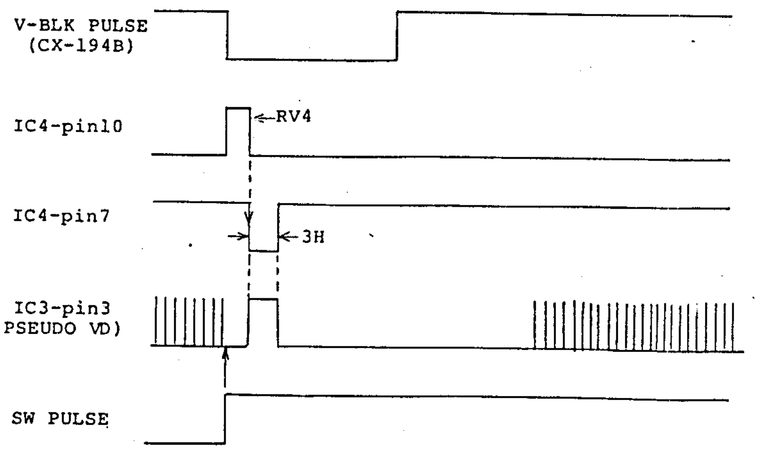
6-1-3 ϕ^2 (Phai Square) Servo

The drum phase servo controls the phase of the video head by comparing the PG signal with the REF VIDEO. However, because this function is not accurate enough, an edited piont may be momentarily disturbed due to the temperature characteristic of the phase servo loop. To solve this problem, the ϕ^2 servo keeps the PB video signal with the REF video signal completely coincident. The function of the ϕ^2 servo is as follows. and operates every odd field.

In the playback mode, the PB V SYNC is compared with the REF V SYNC, and the phase error is fed to the drum phase PWM servo loop. The ϕ^2 error detected by the counter in the ϕ^2 comparator is added to the drum phase PWM circuit to correct the phase error.

In the REC mode, the REF SYNC separated from the input video signal by IC2 on the SV-57C board and the V-BLK pulse generated in the CX-194 are delayed by the monostable multivibrator (MMV) IC4. Then, the next MMV IC4 makes an approximately 3H wide pulse, which is inverted by IC3 and fed to the PB SYNC input of CX-194 as a PSEUDO VD. The SEPARATED SYNC of the EE or REC video is reshaped by Q1 and Q2, differentiated by Q3, C25 and R13, and input to pin 2 of IC3. The switching pulse differentiated by C28 and R30 is input to pin 13 of IC3 and the insertion of the differentated H SYNC is inhibited around the PSEUDO VD to prevent interference.





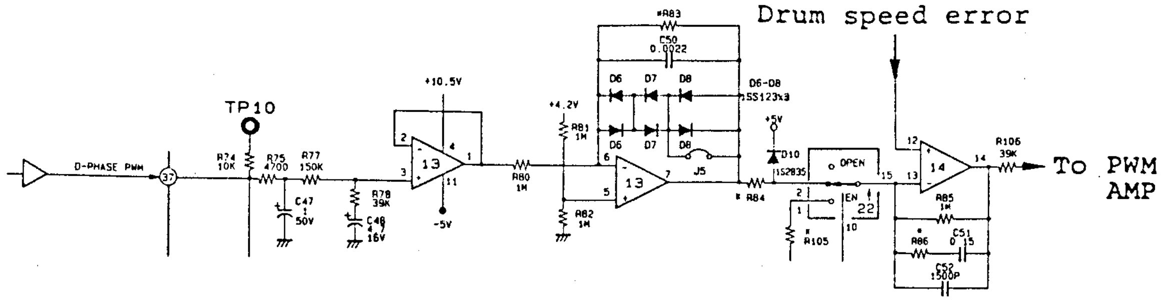
6-1-4 Framing Servo

The purpose of the framing servo is to create a field sequence such as odd-even-odd at the editing point to correct picture disturbance.

In IC1, the framing pulse corresponding to the even field is generated out of the REF SYNC. The even field is detected by checking the H phase. The framing pulse, which is generated only in the even field, is also used as a reference signal for the drum servo and the record CTL signal. In this way, the even field or odd field can be matched with the CH-A head or CH-B head. When the H:PINCH ON signal (CN13-1) is supplied to pin 14 of IC1, the framing circuit is enabled in IC1. In IC1, the framing pulse is sent to the INT VD generator, where the 1/2 VD signal is created with the frame. That is, the high or low level of 1/2 VD has the relation of an even field. Comparing the framing pulse with 1/2 VD, if the reverse phase is detected three times continuously, the phase of 1/2 VD is inverted. Finally, 1/2 VD has the framing information.

When the FRAMING ON signal is high, framing works. When the FRAMING ON signal is low, no framing information is applied to 1/2 VD and the frame is lost.

The DRUM PHASE PWM (IC1 - Pin 37), rectified by R75 and C47, passes the phase delay compensator (R77, R78 and C48) and is supplied to the buffer amplifier IC13. Then, it is limited by D6 - D8 and fed to pin 2 of IC22. In the normal mode, the output at pin 15 of IC22 is input to pin 13 of IC14 and mixed with the dc component of DRUM SPEED PWM.

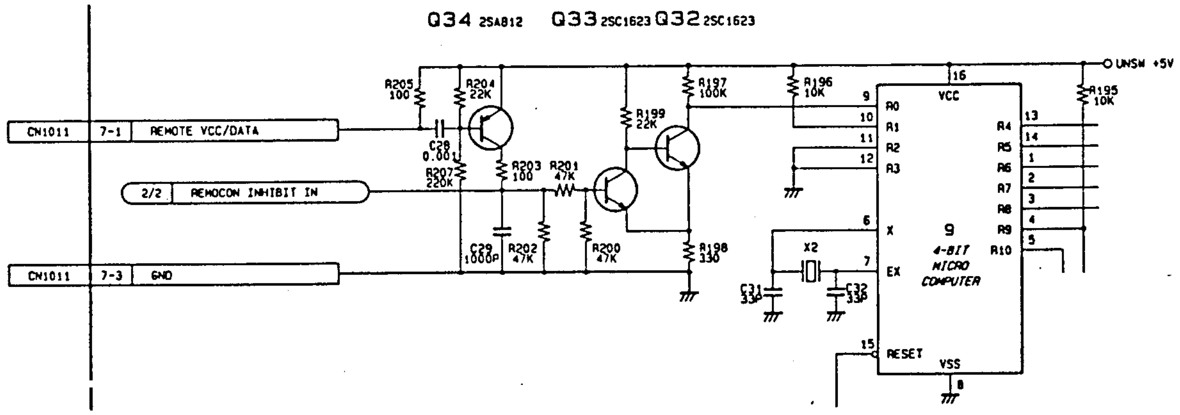


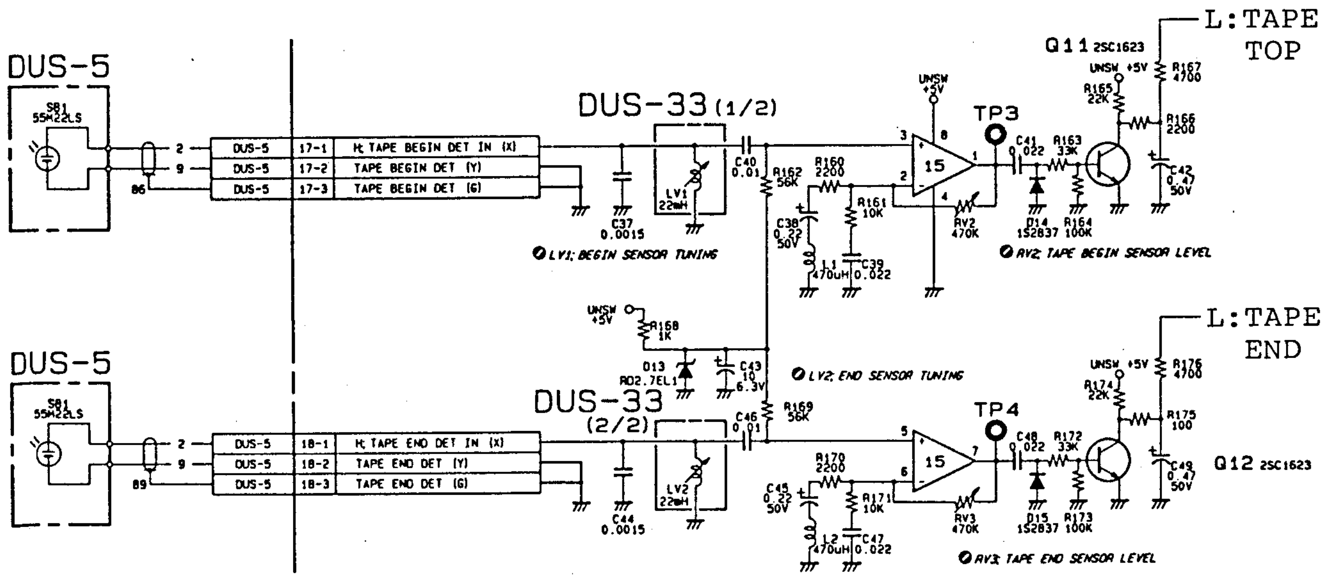
7-2-4. Remote Control Circuit

The remote control circuit consists of Q32, Q33, Q34 and IC9. The correspondence between the remote control and the BVU-150P is done through two lines. One is the ground line; the other is used to supply power and to transfer serial data. The power is modulated by the 400kHz data. The serial data sent from the remote controller is differentiated, amplified by Q34, integrated, reshaped by Q33 and Q32, and fed to pin 9 of IC9. The serial data is converted to 6 bits in IC9 and sent to the IC1 microprocessor via the port expander IC3 through IC6.

7-2-5. Tape Top/Tape End Sensor Circuit

The detecter circuits of the tape top and tape end are the same. The tape top sensor circuit is composed of IC15 (1/2) and Q11. The L:TAPE TOP signal is input to pin 5 of the port expander IC5. The tape end sensor circuit consists of IC15 (2/2) and Q12. The L:TAPE END signal is input to pin 5 of the port expander IC6.





7-2-6. Photodiode Drive Circuit

Q13, Q14, Q16, Q17 and IC21 on the SY-18 board, form the photodiode drive circuit. To save power, current is supplied to the LEDs only when required. This LED's output is modulated by 16KHz clock.

Others

SL3: Slit SL3 located at pin 6 of IC6 is used as follows.

OPEN—Only remote-control signals are accepted. (However, only the STOP and EJECT function of the BVU-150P is operative.)

SHORT—The BVU-150P receives both key inputs and the remote control signals. Normally it is shorted.

7-3. SY-22 Board

The SY-22 board consists of the PB servo control IC2, the character generator IC4, and the expander for IC2 on the SY-18 board.

7-3-1. Character Generator Circuit

The character generator IC4, which is controlled by microprocessor IC2, generates characters to display the amount of tape remaining on the viewfinder. The output of the CONFI head is input to IC3, and the separated H SYNC is input to pin 19 of IC4.

The output at pin 14 of IC4 determines the area to be displayed. Pin 13 of IC4 outpus the characters. RV1 adjusts the frequency of the oscillator in IC4 to control the horizontal width of characters on the viewfinder.

The width of the driver pulse sent to each solenoids is:

Duration of ON: 50ms

Duration of OFF: 30ms

Others

SL2, SL3:	Slits SL2 and SL3 adjust the times of backspace editint to compensate mechancal tolerance.
S1:	This switch is used for the diagnostic display on the LCD.

7-4. SY-23 Board

The SY-23 board driver circuit energizes the solenoids. The circuit of Q43 on SY-23 board and C38 through C40 on the SY-22 board disengage the solenoids when UNREG +12V is lost. When UNREG +12V is lost, Q43 turns on and the solenoids of PINCH/T-BRAKE/S-BRAKE are disengaged. However, the idlers of T-side and S-side are not broken off as they are when the power switch is turned on again.

7-5. Time Code Block

The BKU-150/150P time code generator is designed for use with the BVU-150/150P portable video cassette recorder.

When the BKU-150/150P is connected to the BVU-150/150P, the LTC (Longitudinal Time Code) is automatically recorded on the tape address track. External controls allow selection of VITC (Vertical Interval Time Code) recording. Time data and user bits data from the BKU-150/150P are indicated by the VTR display.

7-5-1. Features

Compact design and easy connection

The BKU-150/150P attaches easily to the BVU-150/150P portable video cassette recorder via plug-in type connectors. Captive screws secure the module to the VTR.

FRED-RUN/RECORD-RUN mode selectable

The time code generator can be set to run continuously or to run only during recording.

VITC (Vertical Interval Time Code) capability

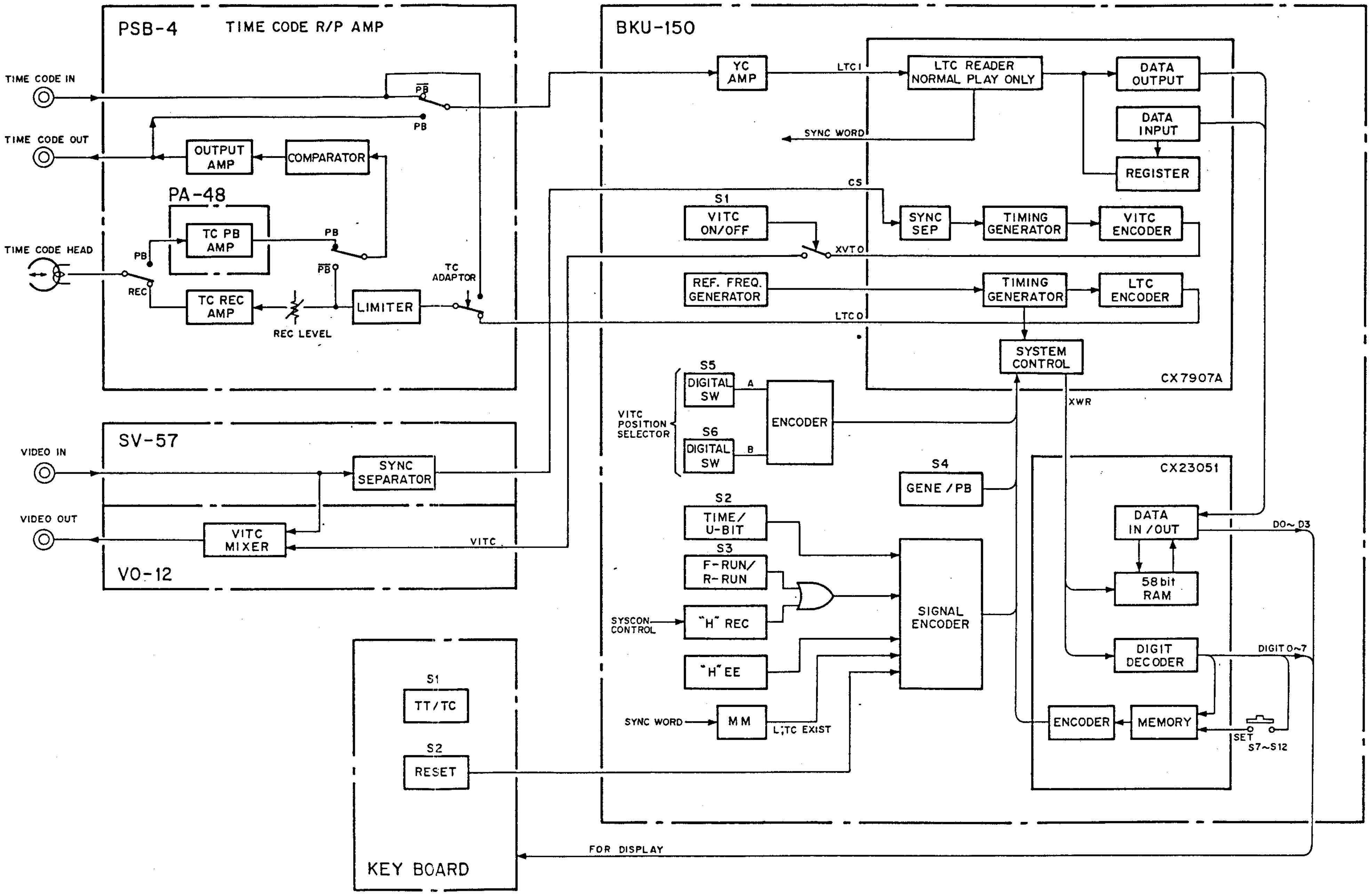
The time data can be recorded on any two lines of the V-blanking interval.

User bits entry

A six digit hexadecimal number can be entered as user bits data.

Time code reader incorporated

The BKU-150/150P reads the longitudinal time code at a normal bit rate (normal play speed). Both time data and user bits are displayed.



External time code with slave lock

The generator can be slave-locked to the external time data.

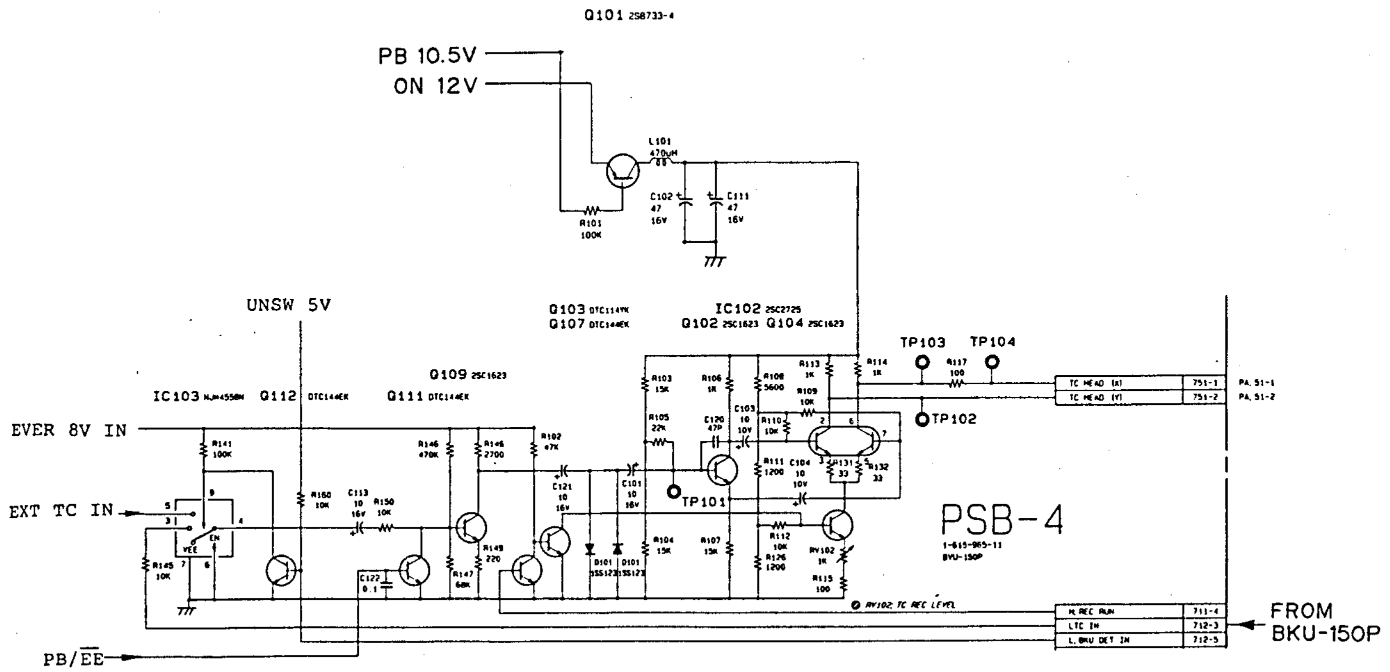
The time code block diagram is shown on the preceding page.

The time code recording block is located on the PSB-4 board of the BVU-150P. In the REC mode, an external time code signal from the TIME CODE IN connector or a time code signal from the BKU-150P is fed to the PSB-4 board. The two time code signals are selected by an L: BKU DET signal. In other words, when the BKU-150P is incorporated into the BVU-150P, an LTC signal from the BKU-150P is recorded. The LTC signal is passed through limiter D101 on the PSB-4 board and recorded by the time code head after the recording current is adjusted using an REC amplifier. This LTC signal is also output from the TIME CODE OUT connector.

The time code REC amplifier consists of IC102 and Q104 on the PSB-4 board.

Q101 is turned on only in the EE mode. At this time, Q101 supplies power to the REC amplifier.

Q107 is turned on and Q103 is turned off only when the tape is running in the REC mode by using an H: REC RUN signal fed to pin 4 of connector CN711. At this time, current flows through Q104 to record the signal via the time code head.

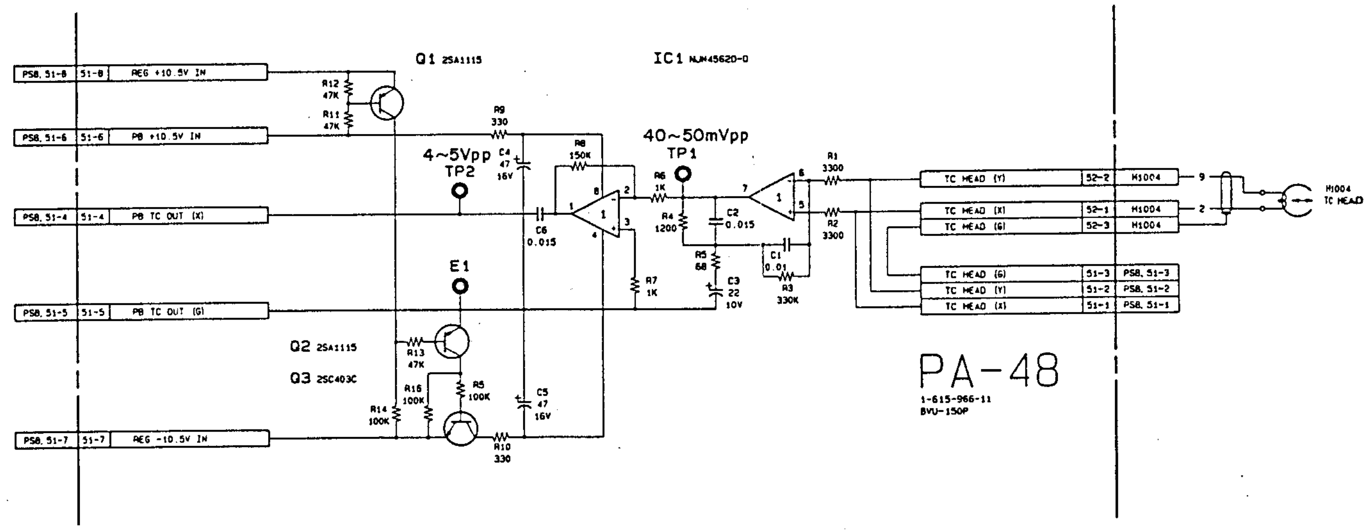


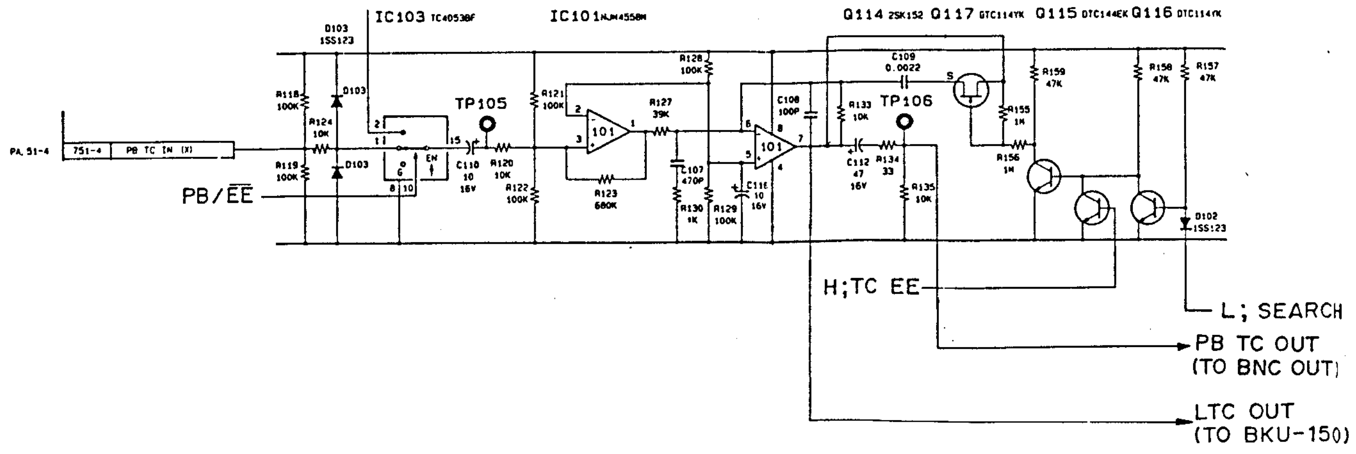
In the PB mode, the playback signal from the time code head is amplified using a head amplifier on the PA-48 board. Then, the resultant signal is output through a comparator and output amplifier on the PSB-4 board from the TIME CODE OUT connector. The signal from the output amplifier is also fed to BKU-150P and sent through a time code amplifier to LTC reader CX-7907A.

Output of the playback signal (less than 1mVp-p) from the time code head is amplified by approximately 36dB/1kHz using IC1 (1/2) on the PA-48 board and amplified by 44dB using amplifier IC1 (2/2) in the next stage. Output at TP2 is approximately 4 to 5Vp-p.

Output from the head amplifier is fed to pin 4 of connector CN751 on the PSB-4 board. Then, the output signal is fed through limiter D103 and switch IC103 to hysteresis comparator IC101 (1/2). This comparator has a hysteresis coefficient of 4V±0.2Vp-p, and it eliminates both crosstalk contained in pin 2 of switch IC103 and mechanical vibration noise.

Thereafter, the signal is fed through output amplifier IC101 (2/2) to the TIME CODE OUT connector and BKU-150P.





BKU-150P (TC-30 Board)

The schematic diagram of TC-30 board is shown in the next peage.

IC1 (CX-7907A) is used for the time code generator and reader.

Output from oscillator X1 is input to pin 20 of IC1 and used as a system clock pulse for IC1. Oscillator X2 is oscillated at 31.25kHz, and the oscillating frequency is used as reference of time code timing. Output from X2 is frequency-divided into 1/625 using IC4 and into 1/2 using IC5. The resulting divided output is used as a clock pulse of 25Hz.

Further, a composite sync signal from the servo circuit is input to pin 27 of IC1, and a frame signal is output from pin 24 of IC1. This frame signal generates a pulse by using monostable multivibrator IC7 and resets IC4 and IC5 by output from IC7. As a result, output from IC5 is synchronized with the sync frame signal.

Output from pin 7 of IC5 is fed through jumper wire J10 to phase comparator IC6. The phases of the 25Hz signal and the LTC output signal from IC1 are compared at IC6. In order to control the phase of an LTC signal, an LTC clock signal at pin 58 of IC1 is controlled by applying the phase error to a voltage controlled oscillator (VCO).

IC11 and IC12 are used to inform IC1 of the current BKU-150P operation mode. These ICs convert the parallel input signal into a serial signal and control IC1. Output from IC11 is input to pin 62 of IC1 (SWSI). Inputs S0 through S7 of IC11 and their corresponding signal levels are shown below.

The phase correction ON/OFF selection of S3 is done to perform time code phase correction at the recording start point during back-space editing.

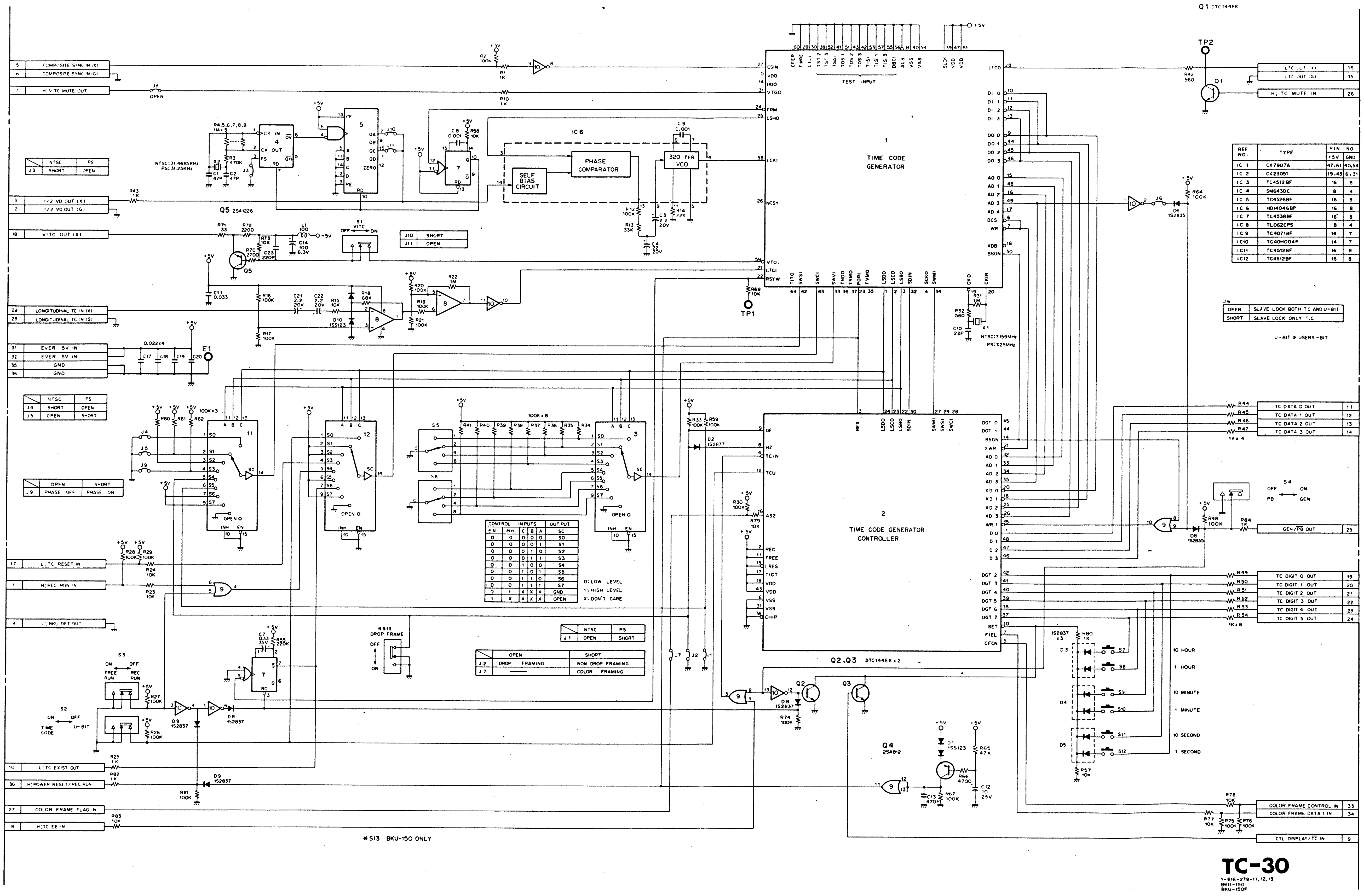
For the BKU-150P, the phase correction ON/OFF select is usually set to OFF.

		S0	S1	S2	S3	S4	S5	S6	S7	
Pin 62 of IC1	SWSI	FBS1	FBS2	FBS3	PHASE	S1	S2	S4		LEVEL
	IC1/	H			OFF			H		H
	TC-30		L	H	ON	L	L			L

S0–S2: VITC field mark or LTC BI-PHASE mark correction position select (LTC bit No. = 59)

S4–S6: Signal format select

TC-30 ; TIME CODE GEN/READER



	NTSC	PS
J3	SHORT	OPEN

	NTSC	PS
J4	SHORT	OPEN
J5	OPEN	SHORT

	OPEN	SHORT
J9	PHASE OFF	PHASE ON

J10	SHORT
J11	OPEN

CONTROL	INPUTS				OUTPUT
EN	INH	C	B	A	SC
0	0	0	0	0	S0
0	0	0	0	1	S1
0	0	0	1	0	S2
0	0	0	1	1	S3
0	0	1	0	0	S4
0	0	1	0	1	S5
0	0	1	1	0	S6
0	0	1	1	1	S7
0	1	X	X	X	GND
1	X	X	X	X	OPEN

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE

	NTSC	PS
J1	OPEN	SHORT

	OPEN	SHORT
J2	DROP FRAMING	NON DROP FRAMING
J7	——	COLOR FRAMING

REF NO.	TYPE	PIN NO.	
		+5V	GND
IC 1	CX7907A	47,61	40,54
IC 2	CX23051	19,43	6,31
IC 3	TC4512BF	16	8
IC 4	SM6430C	8	4
IC 5	TC4526BF	16	8
IC 6	HD14046BP	16	8
IC 7	TC4538BF	16	8
IC 8	TL062CPS	8	4
IC 9	TC4071BF	14	7
IC10	TC40H004F	14	7
IC11	TC4512BF	16	8
IC12	TC4512BF	16	8

J6

OPEN	SLAVE LOCK BOTH T.C AND U-BIT
SHORT	SLAVE LOCK ONLY T.C

*S13 BKU-150 ONLY

TC-30

1-616-279-11, 12, 13
BKU-150
BKU-150P

Inputs S0 through S7 of IC12 and their corresponding signal levels are shown on the right.

IC3 is used to convert VITC insertion position data, selected by switches S5 and S6, from parallel signals into serial signals and to send this data to pin 33 of IC1 (SWVI).

The right tables show the relationships between the position select signals and the insertion line numbers.

The VITC signal is output from pin 59 of IC1 and fed through switch S1 and emitter follower Q5 to the KY-86 board. Then, the resultant signal is mixed with an input video signal on the VO-12 board.

The PB LTC signal from the time code head or external LTC signal from the TIME CODE IN connector is fed to pin 29 on the TC-30 board and sent through amplifier IC8 and a comparator to pin 21 of IC1. LTC signal output from IC1 is output from pin 28 of IC1 and fed through the PSB-4 board circuit to the TIME CODE OUT connector. In the REC mode, the output signal is recorded by the head.

When an H: TC MUTE IN signal is input to pin 26 on the TC-30 board, the LTC signal is muted using Q1. When the BVU-150P enters the PB mode and the BKU-150P GEN/PB select switch is set to PB, the H:TC MUTE signal goes high.

The power on reset detection circuit consists of Q4, IC9 and D1. When the VTR battery is removed, this circuit detects whether an EVER 5V power supply is backed up or not. When this EVER 5V power supply falls to less than 4V and battery power is restored, Q4 is turned on and a high-level signal is output to pin 11 of IC9 to reset each circuit.

		S0	S1	S2	S3	S4	S5	S6	S7	
Pin 63 of IC1	SWCI	TIUB	TICT		RESET	RUHO	DLOD	SLAVE		LEVEL
		TIME U-BIT	TM.UB CTL	H	OFF ON	RUN HOLD	DATA LOAD	OFF ON	H	H L

		S0	S1	S2	S3	S4	S5	S6	S7	
Pin 33 of IC1	SWVI	SW1A	SW1B	SW1C	SW1D	SW2A	SW2B	SW2C	SW2D	

VITC position select

SW1A SW2A	SW1B SW2B	SW1C SW2C	SW1D SW2D	VITC insertion line No. PAL. SECAM
L	L	L	L	22,335
H	L	L	L	21.334
L	H	L	L	20,332
H	H	L	L	19,331
L	L	H	L	18,330
H	L	H	L	17,329
L	H	H	L	16,328
H	H	H	L	15,327
L	L	L	H	14,326
H	L	L	H	13,326
L	H	L	H	12,325
H	H	L	H	11,324
L	L	H	H	10,323
H	L	H	H	9,322
L	H	H	H	8,321
H	H	H	H	7,320

To display an LCD on the BVU-150P front panel, the time code data is fed from TC DATA 0 through 3 to a microcomputer on the KY-86 board. Moreover, the time code address is also fed using TC DIGITs 0 through 5 to a microcomputer on the KY-86 board.

When the signal appearing at pin 9 of IC9 is low, slave lock is inhibited. The user bits slave-lock function is determined by jumper wire J6. When the BKU-150P GEN/PB select switch is set to PB, the slave-lock function of the time data and the user bits are inhibited.

The time code is preset using diodes D3 through D5 and switches S7 through S12. The preset mode is controlled using IC2.

The time code preset is inhibited by Q2 and Q3. When the BKU-150P GEN/PB select switch is set to PB or the BVU-150P CTL/TC select switch is set to CTL, the time code preset function is inhibited.

IC7 detects the time code signal fed to pin 5. When the time code signal is detected, a low-level signal is output to pin 7 for the slave-lock operation. When FREE RUN/REC RUN select switch S3 is set to REC RUN, the slave-lock operation is inhibited.

The relationship between the switch statuses and the modes is shown on the next page.

BVU-150 DIAGNOSTIC FUNCTION

1. OUTLINE

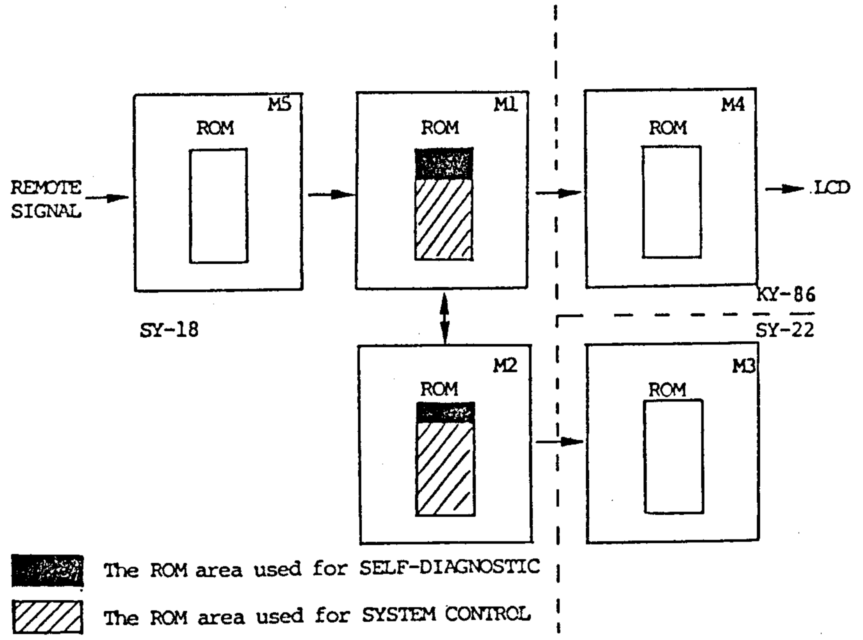
The BVU-150 portable, U-matic SP videocassette recorder is compact, gives high performance and is easy to operate. And for field sevice engineers, it is easier than ever to handle, because it incorporates the convenient self diagnostic function.

If the system controller in a microcomputer-controlled device is defective, the cause of the defect is usually not easy to find. To solve this problem, the BVU-150 has a diagnostic function which determines if the source of the problem is in the microcomputer itself or not.

Operation of self diagnostic function

The self diagnostic function of the BVU-150 is rather simple and in a sense, can be called primary. It can only indicate the I/O port data in each mode, step by step on the LCD display, for comparison with the table in the service manual. That is, it only works to help you know whether the defect is in the microcomputers or in other parts of the unit. Telling exactly which part needs repairing as well as displaying complete I/O data is beyond the ability of this function, because it had to be designed within the unsparing size restriction. Nevertheless, it can be a great help in field servicing, by facilitating troubleshooting.

With the BVU-150, self diagnostic has been made possible using those ROM areas of the M1 and M2 microcomputers which are not used for system control. Totalling approx. 100 bytes in capacity, these areas contain programs for latching the I/O port data to be shown on the front panel LCD indicator. The heart of the BVU-150's self diagnostic function is M1. It takes in the necessary data from M2, M3 and M5 and transmits them to the LCD indicator through M4.
The diagnostic functions are used only during service operations and are not intended to directly inform the operator as to the cause of the defect. Because the BVU-150 is portable, its size and scope of its diagnostic function is by necessity limited. Information at each I/O port can only be output through the diagnostic functions. However, the operator is always informed of the necessity of field service through displays.


M5
ROM
REMOTE SIGNAL
M1
ROM
M4
ROM
LCD
KY-86
SY-22
SY-18
M2
ROM
M3
ROM
The ROM area used for SELF-DIAGNOSTIC
The ROM area used for SYSTEM CONTROL

2. DIAGNOSIS IN SYSTEM CONTROLLER HARDWARE

The mechanical signal flow in the BVU-150 system control circuit is as shown in the next page.

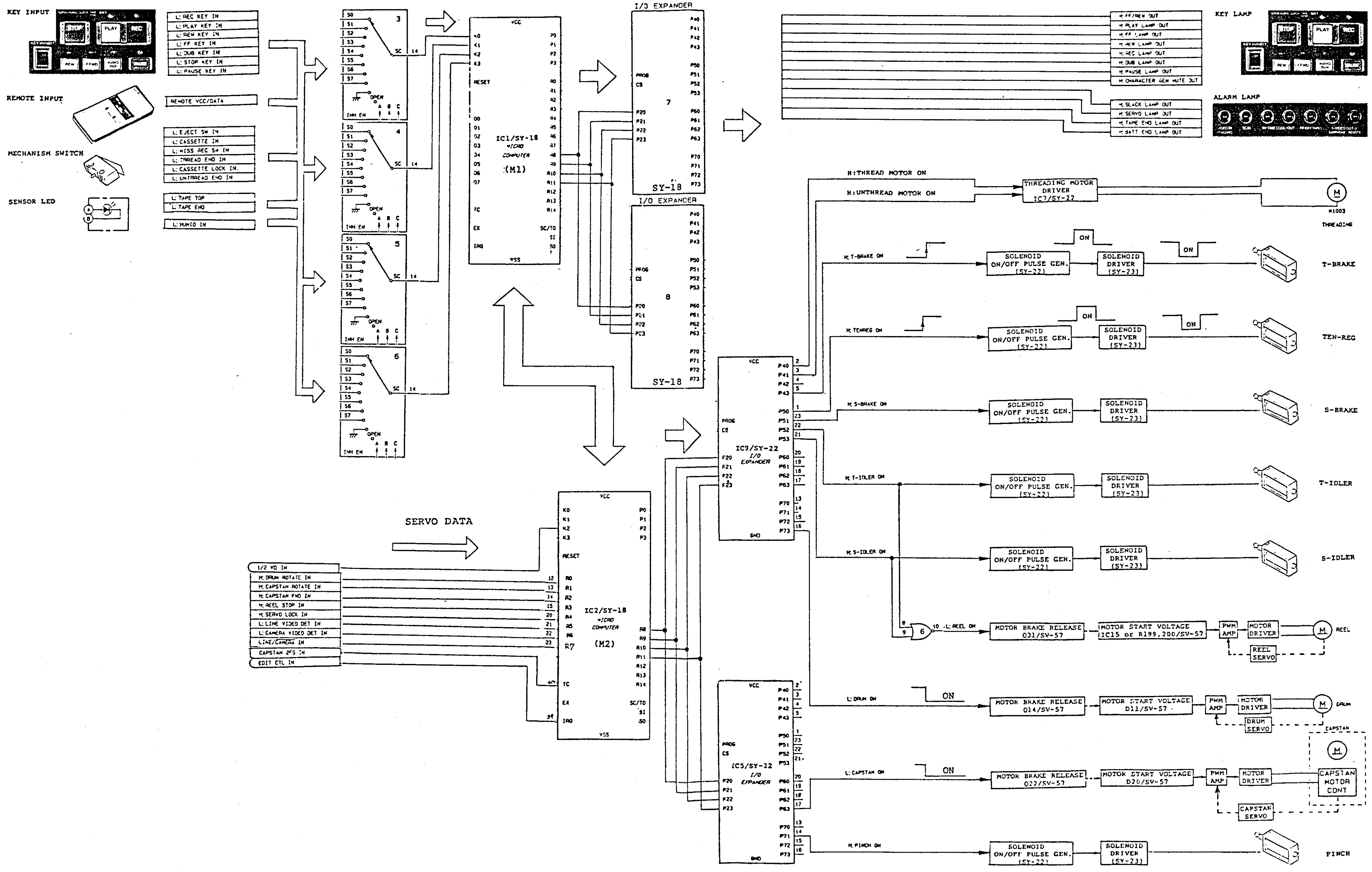
As shown in the illustration, one-chip microcomputers M1 and M2 control the sytem controller.

Microcomputer M1 is a master microcomputer which controls the system of the BVU-150. Microcomputer M2 is a slave one which generates commands, i.e., REC/PB commands, to the respective mechanisms (the motor or solenoid) while transferring data from or to microcomputer M1.

Microcomputers M1 and M2 each provide extension ports, as well as the standard I/O ports. Data is transferred between microcomputers and devices via an extension port to convert data from parallel to serial format and vice versa.

In the BVU-150, data at the I/O ports of microcomputers M1 and M2 can be displayed on the LCD counter.

The output signals fed from each micro-computers are based on their input signals. By checking the input-and-output signals, the source of a defect can be determined.


KEY INPUT
L: REC KEY IN
L: PLAY KEY IN
L: REW KEY IN
L: FF KEY IN
L: DUB KEY IN
L: STOP KEY IN
L: PAUSE KEY IN
REMOTE INPUT
REMOTE VCC/DATA
MECHANISM SWITCH
L: EJECT SW IN
L: CASSETTE IN
L: MISS REC SW IN
L: THREAD END IN
L: CASSETTE LOCK IN.
L: UNTHREAD END IN
SENSOR LED
L: TAPE TOP
L: TAPE END
L: HUMID IN
PLAY
REW
FFWD
AUDIO DUB
S0
S1
S2
S3
S4
S5
S6
S7
SC
14
OPEN
INH EN
A B C
3
4
5
6
IC1/SY-18
MICRO COMPUTER
(M1)
VCC
VSS
RESET
TC
EX
IRQ
SC/TO
SI
SO
I/O EXPANDER
PROG
CS
7
SY-18
8
SY-18
SERVO DATA
1/2 VD IN
H: DRUM ROTATE IN
H: CAPSTAN ROTATE IN
H: CAPSTAN FWD IN
H: REEL STOP IN
H: SERVO LOCK IN
L: LINE VIDEO DET IN
L: CAMERA VIDEO DET IN
LINE/CAMERA IN
CAPSTAN 2FG IN
EDIT CTL IN
IC2/SY-18
MICRO COMPUTER
(M2)
IC9/SY-22
I/O EXPANDER
IC5/SY-22
I/O EXPANDER
GND
H: FF/REW OUT
H: PLAY LAMP OUT
H: FF LAMP OUT
H: REW LAMP OUT
H: REC LAMP OUT
H: DUB LAMP OUT
H: PAUSE LAMP OUT
H: CHARACTER GEN MUTE OUT
H: SLACK LAMP OUT
H: SERVO LAMP OUT
H: TAPE END LAMP OUT
H: BATT END LAMP OUT
KEY LAMP
ALARM LAMP
H: THREAD MOTOR ON
H: UNTHREAD MOTOR ON
THREADING MOTOR DRIVER IC7/SY-22
M
M1003
THREADING
H: T-BRAKE ON
ON
SOLENOID ON/OFF PULSE GEN. (SY-22)
SOLENOID DRIVER (SY-23)
T-BRAKE
H: TENREG ON
TEN-REG
H: S-BRAKE ON
S-BRAKE
H: T-IDLER ON
T-IDLER
H: S-IDLER ON
S-IDLER
6
10 L: REEL ON
MOTOR BRAKE RELEASE 031/SV-57
MOTOR START VOLTAGE IC15 or R199.200/SV-57
PWM AMP
MOTOR DRIVER
REEL SERVO
REEL
L: DRUM ON
MOTOR BRAKE RELEASE 014/SV-57
MOTOR START VOLTAGE D11/SV-57
DRUM SERVO
DRUM
CAPSTAN
L: CAPSTAN ON
MOTOR BRAKE RELEASE 022/SV-57
MOTOR START VOLTAGE D20/SV-57
CAPSTAN MOTOR CONT
CAPSTAN SERVO
H: PINCH ON
PINCH

The display data is displayed in the left four digits of the diagnostic data.

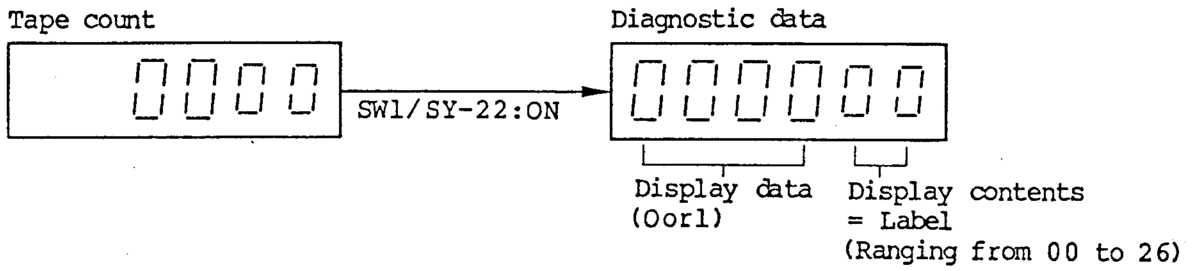
The Label Number for the display data is displayed in the right two digits of the diagnostic data.

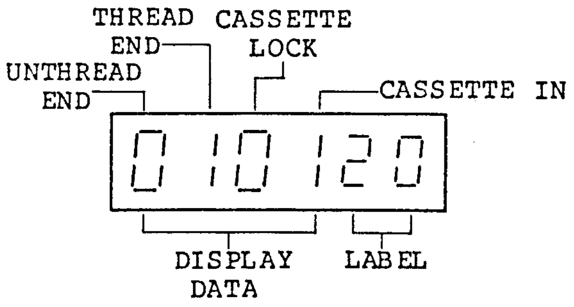
The label Number is represented by a two-digit hexadecimal number in the range of 00 to 26.

The label contents are incremented one by one in a cyclic manner each time the RESET button for the tape count on the front panel is pressed.

Assume that ID number 20-1 is specified as the label No. for self-diagnosis. The right two digits of the diagnostic data are 20. The leftmost digit on the LCD indicates the self-diagnosis signal. If the leftmost digit is logical 1, the designated signal is high. If the leftmost digit is logical 0, the designated signal is low. For example, the CASSETTE IN signal is identified by ID number 20-4. The fourth digit in the display data for a label No. of 20 indicates the CASSETTE IN signal.

→00→01→02 . . . 09→0L→0H→0P→0R→0-→0→10 . . .26





5. The Modes Change in the Order of CASSETTE IN, THREADING, and STD BY ON.
(See the timing chart.)

Note: The circled numbers indicate numbers on the timing chart.

Install a cassette tape into the cassette compartment (CASSETTE INSERTION), and slowly push the cassette compartment down (START OF MOVING CASSETTE COMPARTMENT DOWN). At this time, the L:CASSETTE LOCK (labeled "b") signal immediately ①→goes high and then the L:CASSETTE IN signal goes low when the CASSETTE IN switch (labeled "a") is pressed by the cassette.

If the cassette continues to drop, the cassette ②→compartment is locked and the L:CASSETTE LOCK (labeled "b") signal goes low. (This indicates that the cassette compartment has been depressed.)

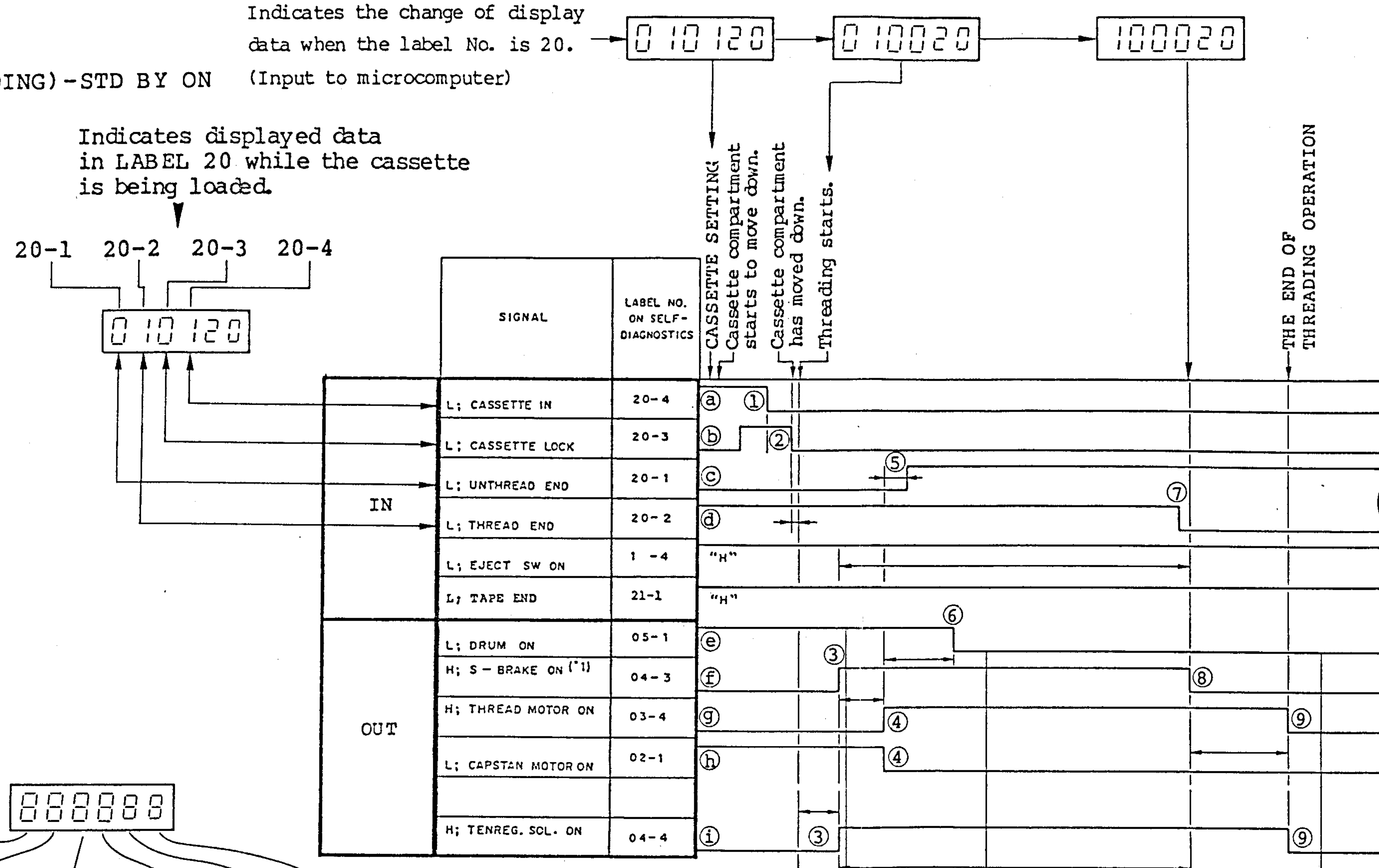
At this moment if the following four signal conditions are satisfied, the microcomputers start threading.

L : UNTHREAD END = Low
L : THREAD END = High
L : EJECT SW ON = High
L : TAPE END = High

③→ The supply reel brake is released 27ms after the microcomputers enter the threading mode, and then the TEN-REG solenoid engages. The capstan ④→and threading motors start rotating 36ms after the supply reel brake is released. Then, the threading ⑤→ring rotates and the UNTHREAD END (labeled "c") signal goes high. The drum motor starts rotating 200ms after the capstan and threading motors start ⑥→rotating. During this time, the threading ring continues to rotate until threading is completed. ⑦→Then, the THREAD END switch (labeled "d") signal goes low. The supply reel brake is applied ten seconds after the supply reel brake is released. ⑧→The threading motor, however, contineus rotating for 500ms to tighten the tape. The threading ⑨→motor then stops and disengages the TEN-REG solenoid. When threading is completed, the system goes to the STD BY ON mode.

Timing Chart

7-2. CASSETTE IN-(THREADING)-STD BY ON



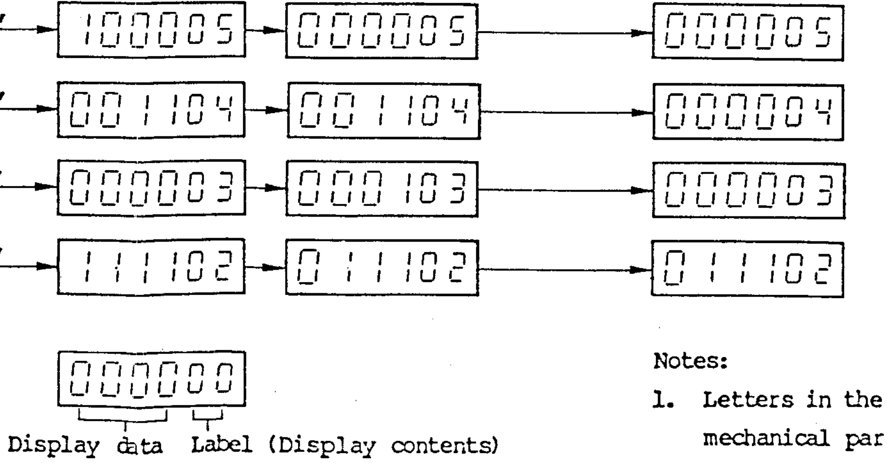
FIGURES OF DISPLAY				LABEL	
1	2	3	4	5	6
$\overline{\text{VIDEO MUTE}}$ "0" (SY-22 IC5-5)	AUDIO MUTE "1" (SY-22 IC5-4)	AUDIO CH-2 $\overline{\text{PB}}$/EE "0/1" (SY-22 IC5-3)	AUDIO CH-1 $\overline{\text{PB}}$/EE "0/1" (SY-22 IC5-2)	0	0
	VIDEO PB/$\overline{\text{EE}}$ "1/0" (SY-22 IC5-22)	$\overline{\text{AUDIO CH-2 REC}}$ "0" (SY-22 IC5-23)	$\overline{\text{AUDIO CH-1 REC}}$ "0" (SY-22 IC5-1)	0	1
$\overline{\text{CAPSTAN MOTOR ON}}$ "0" (SY-22 IC5-17)		$\overline{\text{VIDEO CH-B REC}}$ "0" (SY-22 IC5-19)	$\overline{\text{VIDEO CH-A REC}}$ "0" (SY-22 IC5-20)	0	2
T-BRAKE SOL. ON (*NOTE-1) "1" (SY-22 IC9-5)	PINCH SOL. ON "1" (SY-22 IC9-4)	UNTHREAD MOTOR ON "1" (SY-22 IC9-3)	THREAD MOTOR ON "1" (SY-22 IC9-2)	0	3
S-IDLER SOL. ON "1" (SY-22 IC9-21)	T-IDLER SOL. ON "1" (SY-22 IC9-22)	S-BRAKE SOL. ON (*NOTE-2) "1" (SY-22 IC9-23)	TENREG. SOL. ON "1" (SY-22 IC9-1)	0	4
$\overline{\text{DRUM ON}}$ "0" (SY-22 IC9-16)	DRUM AFC ON "1" (SY-22 IC9-15)			0	5
LOCAL/$\overline{\text{REMOTE}}$ "1/0" (SY-18 IC6-3)	$\overline{\text{COUNTER RESET}}$ "0" (SY-18 IC5-3)	CAMERA $\overline{\text{START}}$/STOP "0/1" (SY-18 IC4-3)	$\overline{\text{EJECT SW}}$ "0" (SY-18 IC3-3)	1	(BLANK)
$\overline{\text{UNTHREAD END}}$ "0" (SY-18 IC6-4)	$\overline{\text{THREAD END}}$ "0" (SY-18 IC5-4)	$\overline{\text{CASSETTE LOCK}}$ "0" (SY-18 IC4-4)	$\overline{\text{CASSETT IN}}$ "0" (SY-18 IC3-4)	2	0
$\overline{\text{TAPE END}}$ "0" (SY-18 IC6-5)	$\overline{\text{TAPE TOP}}$ "0" (SY-18 IC5-5)	$\overline{\text{BP MONITOR}}$ "0" (SY-18 IC4-5)	$\overline{\text{MISS REC SW}}$ "0" (SY-18 IC3-5)	2	1

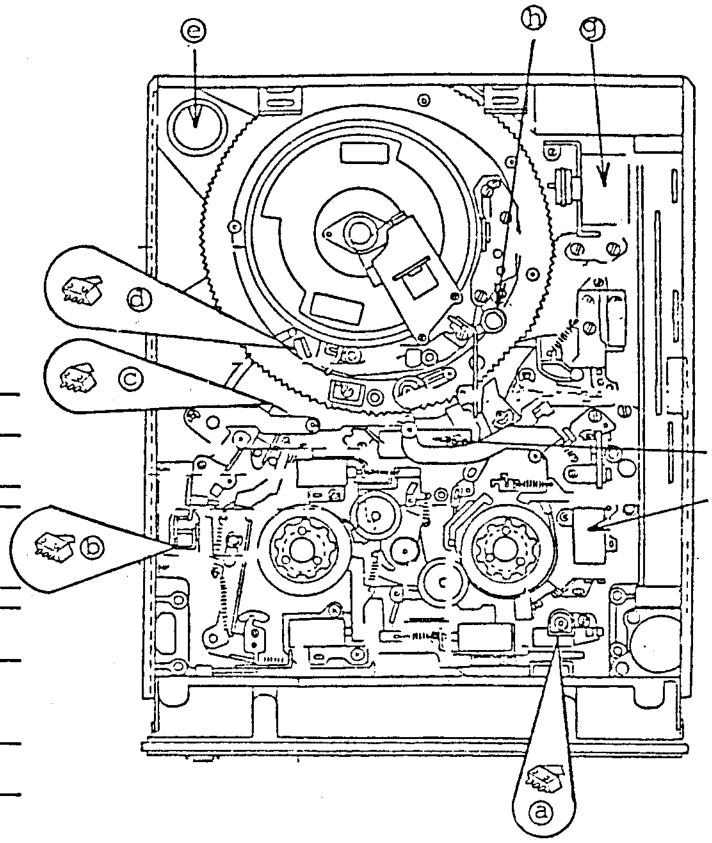
When the label No. is specified as 05, the display data changes as shown.

When the label No. is specified as 04, the display data changes as shown.

When the label No. is specified as 03, the display data changes as shown.

When the label No. is specified as 02, the display data changes as shown.





a : Cassette In SW —► Detects cassette when cassette compartment is being dropped.
b : Cassette Lock SW —► Detects that cassette compartment has moved down and locked.
c : Unthread End SW —► Detects that threading ring has arrived at UNTHREAD END point.
d : Thread End SW
e : Drum Motor
f : S-Brake Solenoid
g : Threading Motor
h : Capstan Motor
i : TEN-REG Solenoid

Notes:

1. Letters in the timing chart are used to identify mechanical parts.
2. Numbers in the timing chart are used to indicate the operating location of the mechanical parts during threading.

7. MECHANISM CONTROL SYSTEM

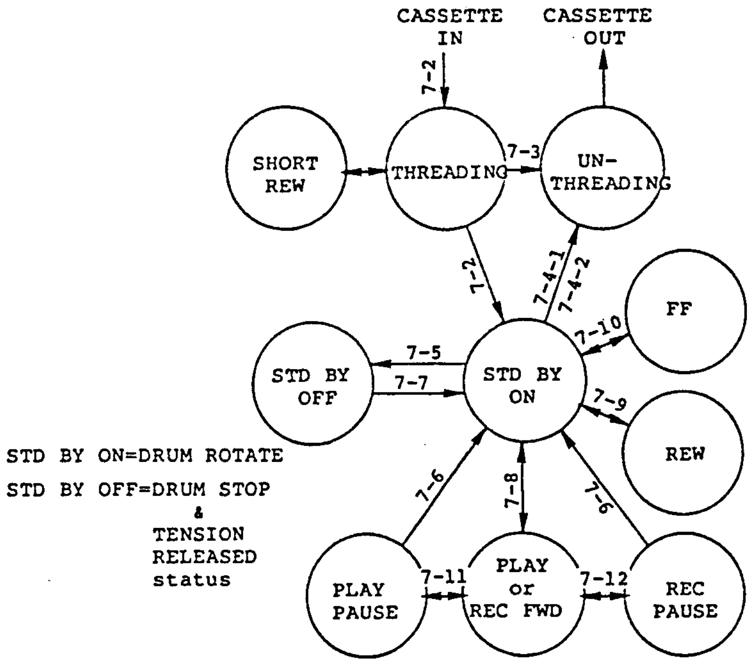
The transition of the mechanism mode is as shown in fig. 8-1. It is organized so that the STOP mode is positioned the center between one mode and the next.

For example, during the transition from FF to REW, the microprocessor performs the job through the STOP mode.

The interval of transition from mode to mode is approximately 100ms. But, the interval of the transition from the FF mode to REW mode is approximately 500ms.

7-1. SHORT REW Mode

When a cassette is inserted, the S-reel supplies the tape which is threaded around the drum. But a full-end cassette is inserted, the tape can not be drawn. In this case, before threading, system control goes to the SHORT REW mode, and the tape is rewound. The conditions to go to the SHORT REW mode are the cassette in, cassette lock, any mode except the EJECT mode, the unthread end status, and the tape end. The time of the tape rewind is one second after the tape is not the tape end.



(The numbers in the illustration indicate the corresponding timing charts which will be described later.)

Fig. 8-1 Transition of mechanism mode.

7-2. THREADING Mode

When the cassette is inserted and the tape is not the tape end, the microprocessor performs the job threading.

The condition to start the threading is as follows.

1. L : CASSETTE IN = Low
2. L : CASSETTE LOCK= Low
3. L : UNTHREAD END= Low
4. L : THREAD END = High
5. L : EJECT EW = High
6. H : TAPE END = Low

Outputs of the system control function THREADING are as follows.

1. L : DRUM ON = High (Drum off)
   If the drum starts to rotate, the plungers can not be activated since the drum motor consumes approximately 2A current. Then the drum motor should be stopped.
2. H : S-BRAKE = High (Brake is released)
   The brake of the S-reel is released since the tape is supplied from the S-reel table when threading. It's timing is delayed 27ms from the DRUM OFF signal.
3. H : THREADING MOTOR = High (Threading motor on)
   L : CAPSTAN ON = Low (Capstan motor on)
   The threading motor and the capstan motor rotate 36ms after the S-brake is released.
4. L : DRUM ON = Low (Drum motor on)
   The drum starts to rotate after the threading motor and the capstan motor rotate. When the L:THREAD END SW signal goes to low, the threading is finished and the system control performs the following functions.

L : THREAD END SW = Low

↓

H : S-BRAKE ON = High (Brake shoe is applied)

↓

The threading ring is tightened.

↓

H : THREADING ON = Low (Threading motor stops)

7-3. When the EJECT Key is Pressed during Threading

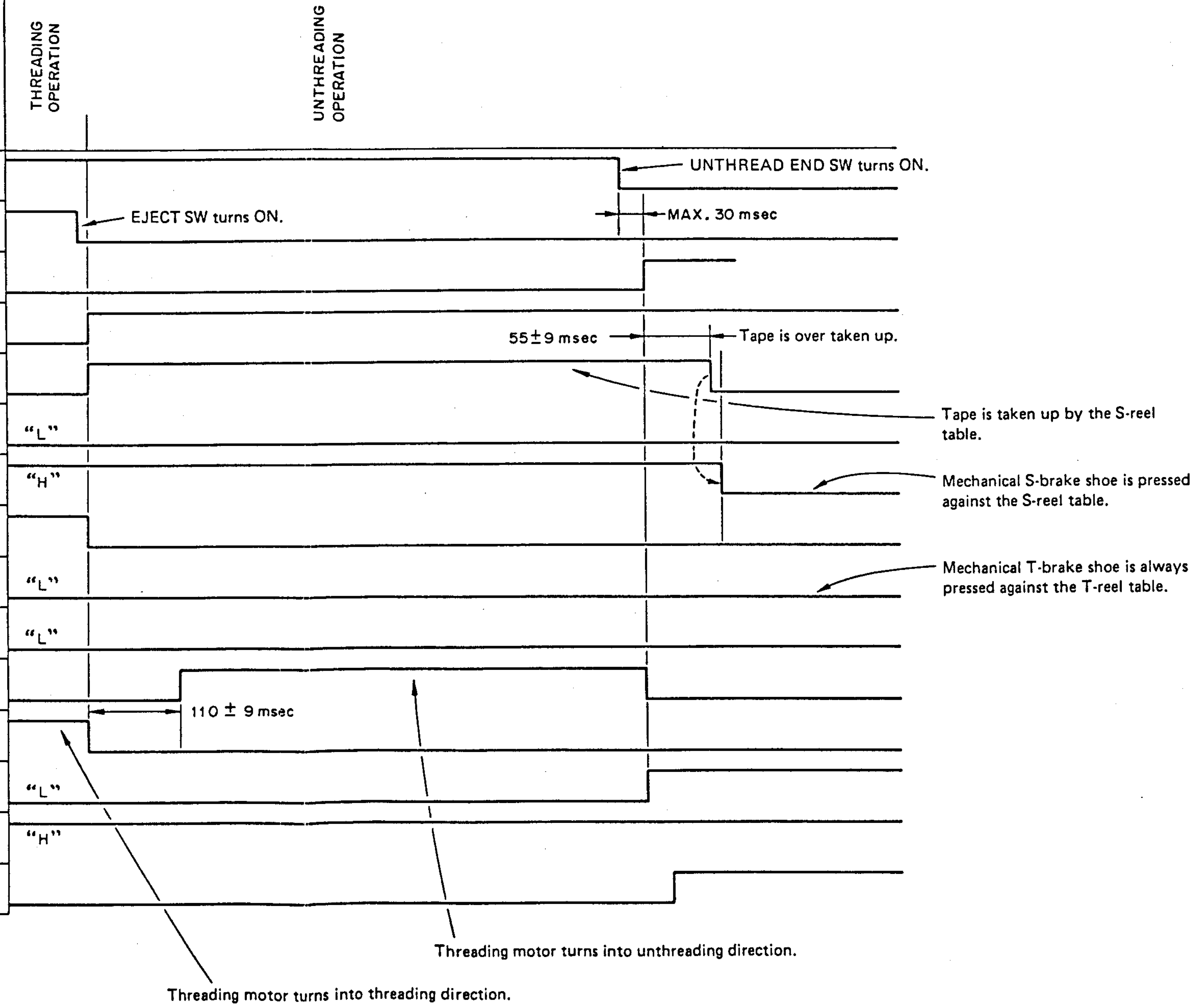
During threading, the drum starts to rotate and the enough current is required to start up the drum so that the plungers can not be activated to due to the lack of current.

That is the reason why the EJECT operation is inhibited during threading and the unthreading is not excuted until the drum builds up the constant speed for 2 sec.

Therefore, in the timing chart, the EJECT SW ON is located where the EJECT button is pressed after the drum reaches the constant speed during threading.

7-3. EJECT OPERATION DURING THREADING

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
UNTHREAD END	L; UNTHREAD END	SY-18 IC6-4	20
EJECT SW	L; EJECT SW ON	SY-18 IC3-3	1U
CASSETTE IN SW	L; CASSETTE IN	SY-18 IC3-4	20
CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY-22 IC5-17	02
S-IDLER SOLENOID ON	H; S-IDLER SOL. ON	SY-22 IC9-21	04
T-IDLER SOLENOID ON	H; T-IDLER SOL. ON	SY-22 IC9-22	04
S-BRAKE ON	H; S-BRAKE ON	SY-22 IC9-23	04
TENREG. SOLENOID ON	H; TENREG. SOL ON	SY-22 IC9-1	04
T-BRAKE ON	H; T-BRAKE ON	SY-22 IC9-5	03
PINCH SOLENOID ON	H; PINCH SOL. ON	SY-22 IC9-4	03
UNTHREAD MOTOR ON	H; UNTHREAD MOTOR ON	SY-22 IC9-3	03
THREADING MOTOR ON	H; THREAD MOTOR ON	SY-22 IC9-2	03
DRUM ON	L; DRUM ON	SY-22 IC9-16	05
FWD / $\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY-18 IC2-2	06
POWER SAVE	H; POWER SAVE	SY-18 IC8-20	16


THREADING OPERATION
UNTHREADING OPERATION
UNTHREAD END SW turns ON.
EJECT SW turns ON.
MAX. 30 msec
55±9 msec
Tape is over taken up.
Tape is taken up by the S-reel table.
"L"
"H"
Mechanical S-brake shoe is pressed against the S-reel table.
"L"
Mechanical T-brake shoe is always pressed against the T-reel table.
"L"
110 ± 9 msec
"L"
"H"
Threading motor turns into unthreading direction.
Threading motor turns into threading direction.

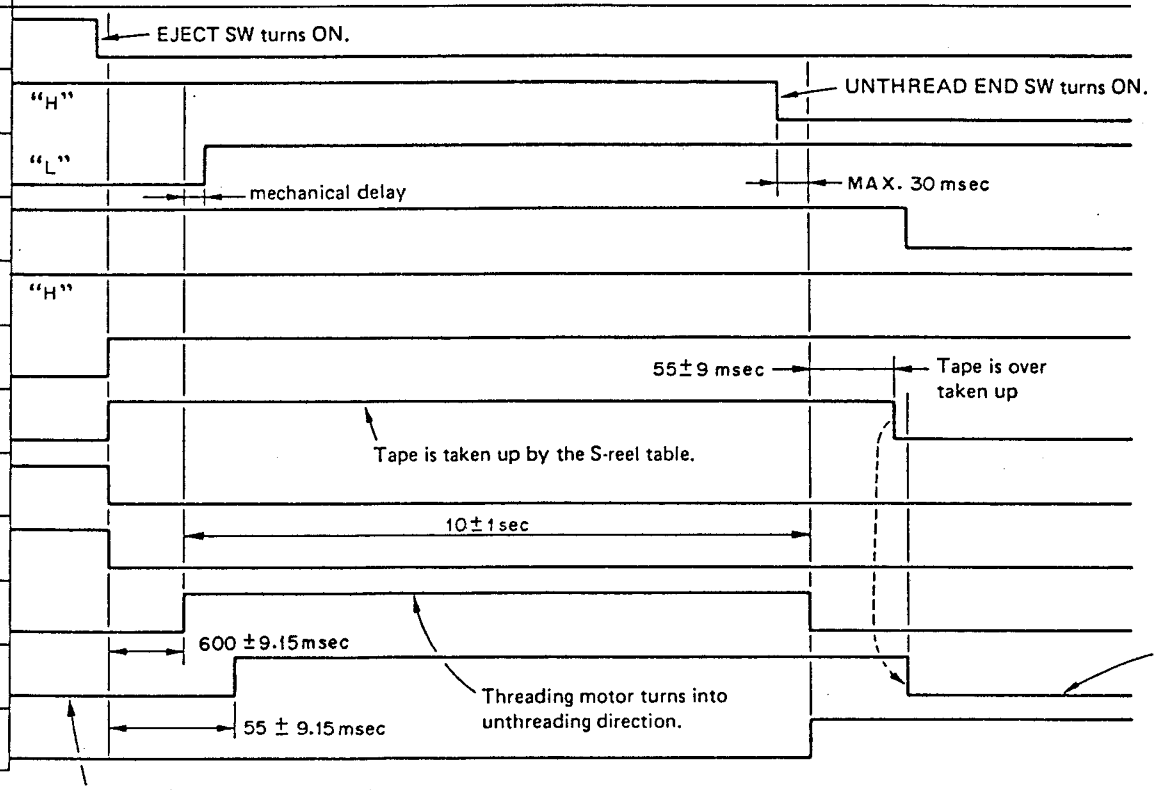
7-4. UNTHREADING Mode

When the microprocessor IC1 on the SY-18 board detects the L:EJECT SW signal, it goes to two routes of unthreading depending on the status of H:DRUM ROTATE or L:HUMID signal

1. S-reel rewind (Normal unthread)
2. T-reel rewind (When the drum motor is not rotating or the humidity is detected.)

7-4-1. UNTHREADING OPERATION FROM STOP MODE (1)

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
EJECT SW	L; EJECT SW ON	SY-18 IC3-3	1U
UNTHREAD END	L; UNTHREAD END	SY-18 IC6-4	20
THREAD END	L; THREAD END	SY-18 IC5-4	20
DRUM ROTATE	H; DRUM ROTATE	SY-18 IC2-12	0H
HUMID	L; HUMID	SY-18 IC5-6	22
CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY-22 IC5-17	02
S - IDLER SOLENOID ON	H; S-IDLER SOL. ON	SY-22 IC9-21	04
FWD / $\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY-18 IC2-2	06
TENREG. SOLENOID ON	H; TENREG. SOL. ON	SY-22 IC9-1	04
UNTHREAD MOTOR ON	H; UNTHREAD MOTOR ON	SY-22 IC9-3	03
S - BRAKE ON	H; S-BRAKE ON	SY-22 IC9-23	04
DRUM ON	H; DRUM OFF L; DRUM ON	SY-22 IC9-16	05



Mechanical S-brake shoe is pressed against the S-reel table.

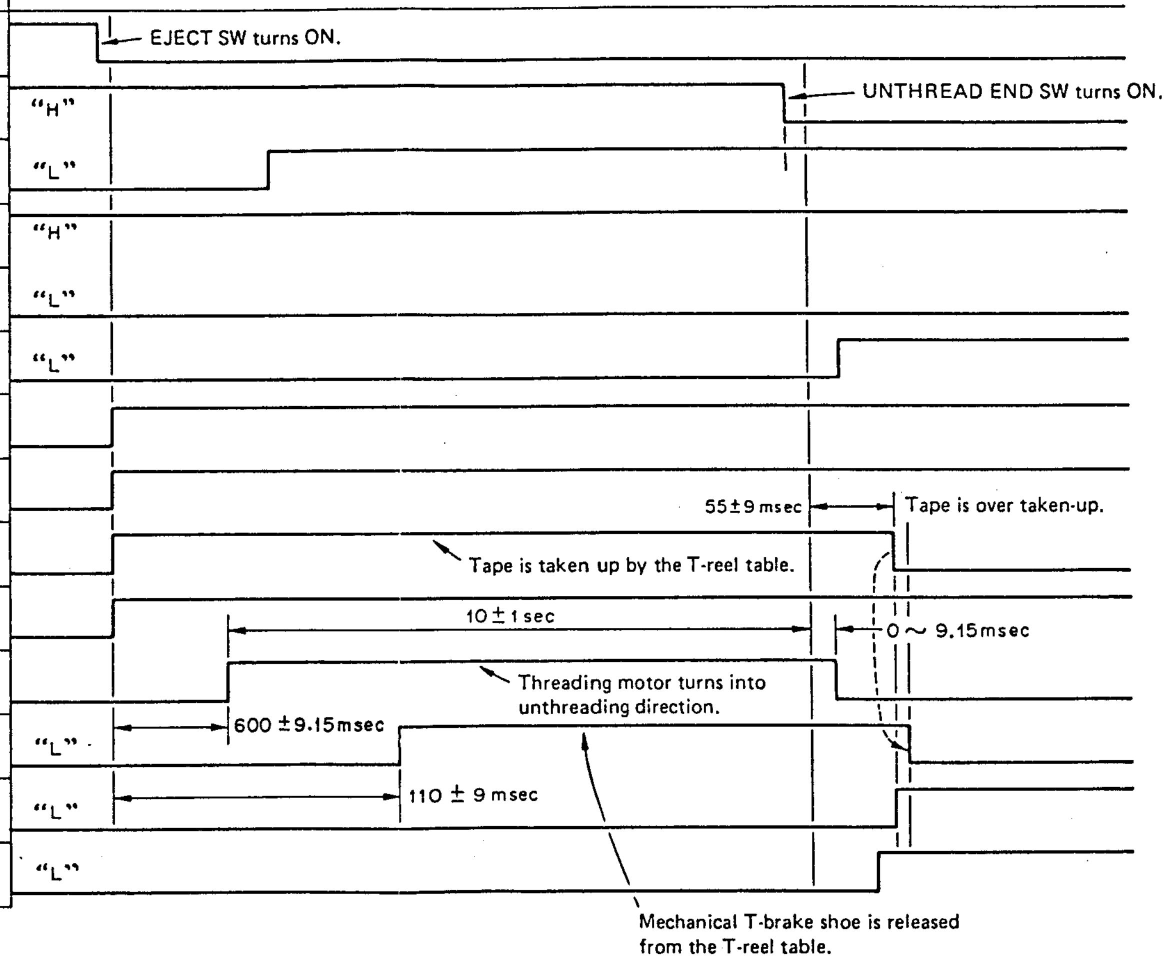
If the UNTHREAD END switch is not turned into "L" level during 10±1 sec, the system control circuit detects as the unthreading trouble, and the following signals change immediately.

- UNTHREAD MOTOR ON: H→L
- DRUM ON: L→H
- S-IDLER SOLENOID ON: H→L
- S-BRAKE ON: H→L
- FDW/REV COMMAND: L→H

Mechanical S-brake shoe is pressed against the S-reel table.

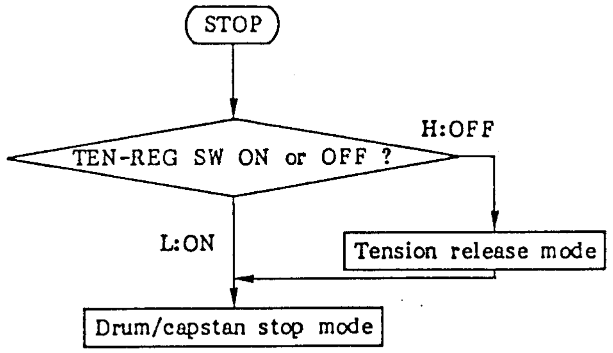
7-4-2. UNTHREADING OPERATION FROM STOP MODE (2)
(When DRUM ROTATE signal or HUMID signal is detected, following operation is performed.)

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
EJECT SW	L; EJECT SW ON	SY-18 IC3-3	1U
UNTHREAD END	L; UNTHREAD END	SY-18 IC6-4	20
THREAD END	L; THREAD END	SY-18 IC5-4	20
DRUM ROTATE	H; DRUM ROTATE	SY-18 IC2-12	0H
HUMID	L; HUMID	SY-18 IC5-6	22
CASSETTE IN SW	L; CASSETTE IN	SY-18 IC3-4	20
CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY-22 IC5-17	02
DRUM ON	L; DRUM ON	SY-22 IC9-16	05
T - IDLER SOLENOID ON	H; T-IDLER SOL. ON	SY-22 IC9-22	04
FWD / $\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY-18 IC2-2	06
UNTHREAD MOTOR ON	H; UNTHREAD MOTOR ON	SY-22 IC9-3	03
T - BRAKE ON	H; T-BRAKE ON	SY-22 IC9-5	03
REEL ON	L; REEL ON	SY-22 IC6-10	
POWER SAVE	H; POWER SAVE	SY-18 IC8-20	16


EJECT SW turns ON.
UNTHREAD END SW turns ON.
"H"
"L"
"H"
"L"
"L"
55±9 msec
Tape is over taken-up.
Tape is taken up by the T-reel table.
10±1 sec
0 ~ 9.15msec
Threading motor turns into unthreading direction.
600 ±9.15msec
"L"
110 ± 9 msec
"L"
"L"
Mechanical T-brake shoe is released from the T-reel table.

7-5. STANDBY ON → STANDBY OFF Mode

To save the power, after the STOP status continues for three second, it goes to the STANDBY OFF status where the drum stops and the tape tension is released.



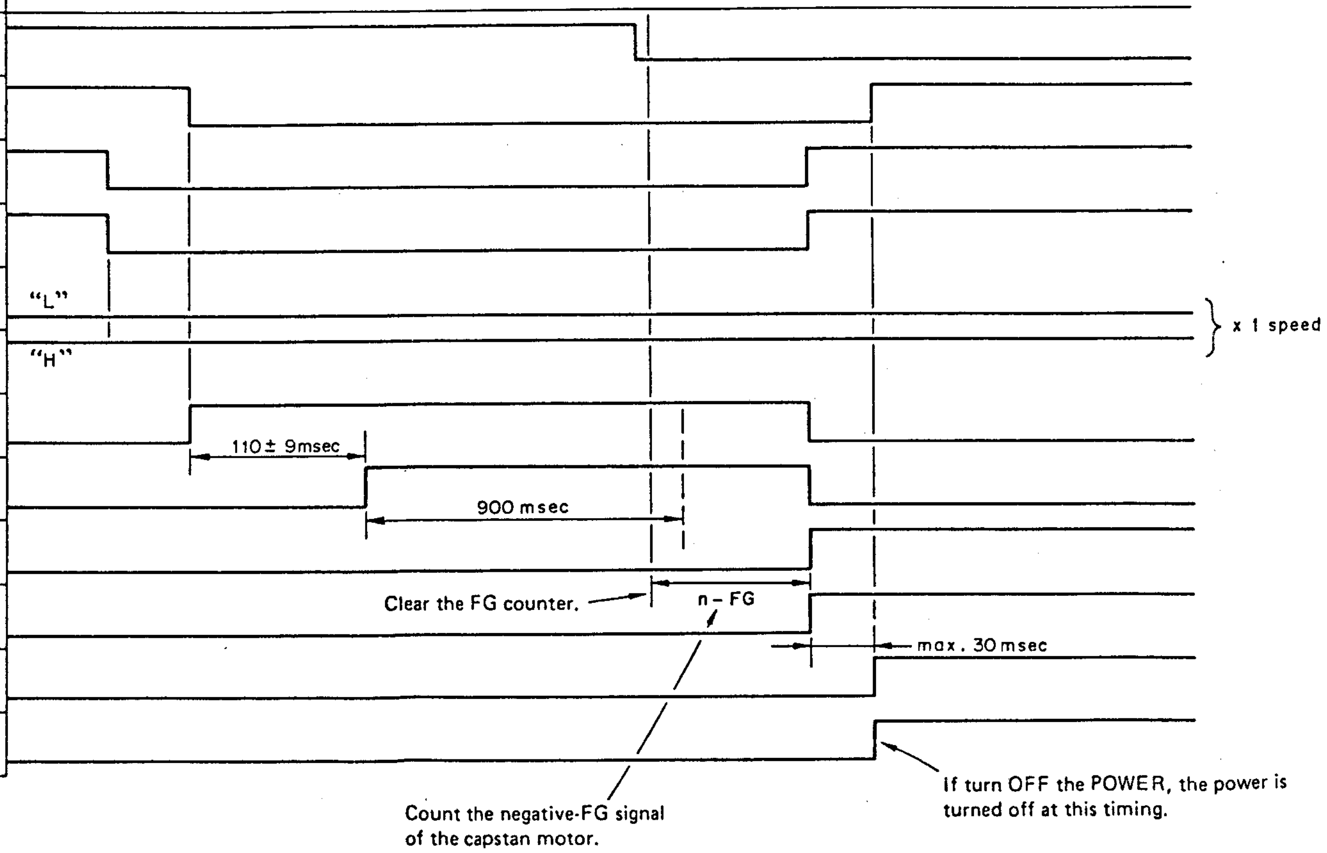
The reed switch installed at the side of the tension regulator detects whether the tape is loose or not. When the tension regulator switch is on, the tape tension release is not done. When the tension regulator switch is off, the tape tension release is done and it goes to drum/capstan stop mode.

If the capstan is set to reverse direction and reverse rotation is not detected in the tension release mode, it performs the next function after 110ms as the reference.

And if the pinch roller engages and the TEN-REG switch does not turns on after 700ms, it goes to the slack mode to protect the tape. Otherwise the tape is advanced.

7-5. STANDBY OFF (TENSION RELEASE MODE)

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
TENREG SOLENOID ON	H; TENREG SOL. ON	SY-22 IC9-4	04
CAPSTAN REV STATUS			0H
FWD/$\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY-18 IC2-2	06
SEARCH	L; SEARCH	SY-18 IC2-1	06
CAPSTAN SPEED 0		SY-18 IC2-7	08
CAPSTAN SPEED 1		SY-18 IC2-8	08
T-BRAKE ON	H; T-BRAKE ON	SY-22 IC9-5	03
PINCH SOLENOID ON	H; PINCH SOL. ON	SY-22 IC9-4	03
DRUM ON	L; DRUM ON	SY-22 IC9-16	05
CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY-22 IC5-17	02
POWER SAVE	H; POWER SAVE	SY-18 IC8-20	16
POWER CONT	H; POWER CONT	SY-18 IC8-19	16

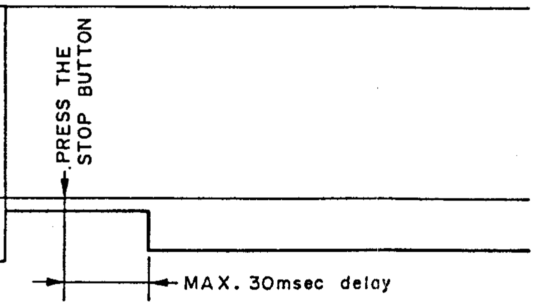

"L"
"H"
x 1 speed
110± 9msec
900 msec
Clear the FG counter.
n-FG
max. 30msec
Count the negative-FG signal of the capstan motor.
If turn OFF the POWER, the power is turned off at this timing.

7-6. STANDBY OFF → STANDBY ON

When the microprocessor recieves the FF, FWD, REW or EJECT command from STANDBY OFF mode, it starts to rotate the drum motor and the capstan motor and goes to each modes after one second.

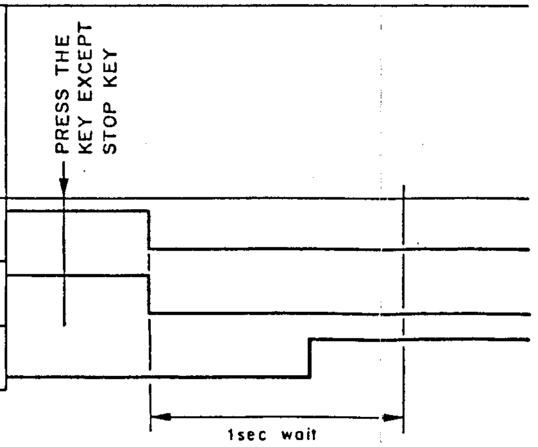
7-6. REC·FWD·PAUSE → STOP and FWD·PAUSE → STOP

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
TENREG. SOLENOID ON	H; TENREG. SOL. ON	SY-22 IC9-1	04



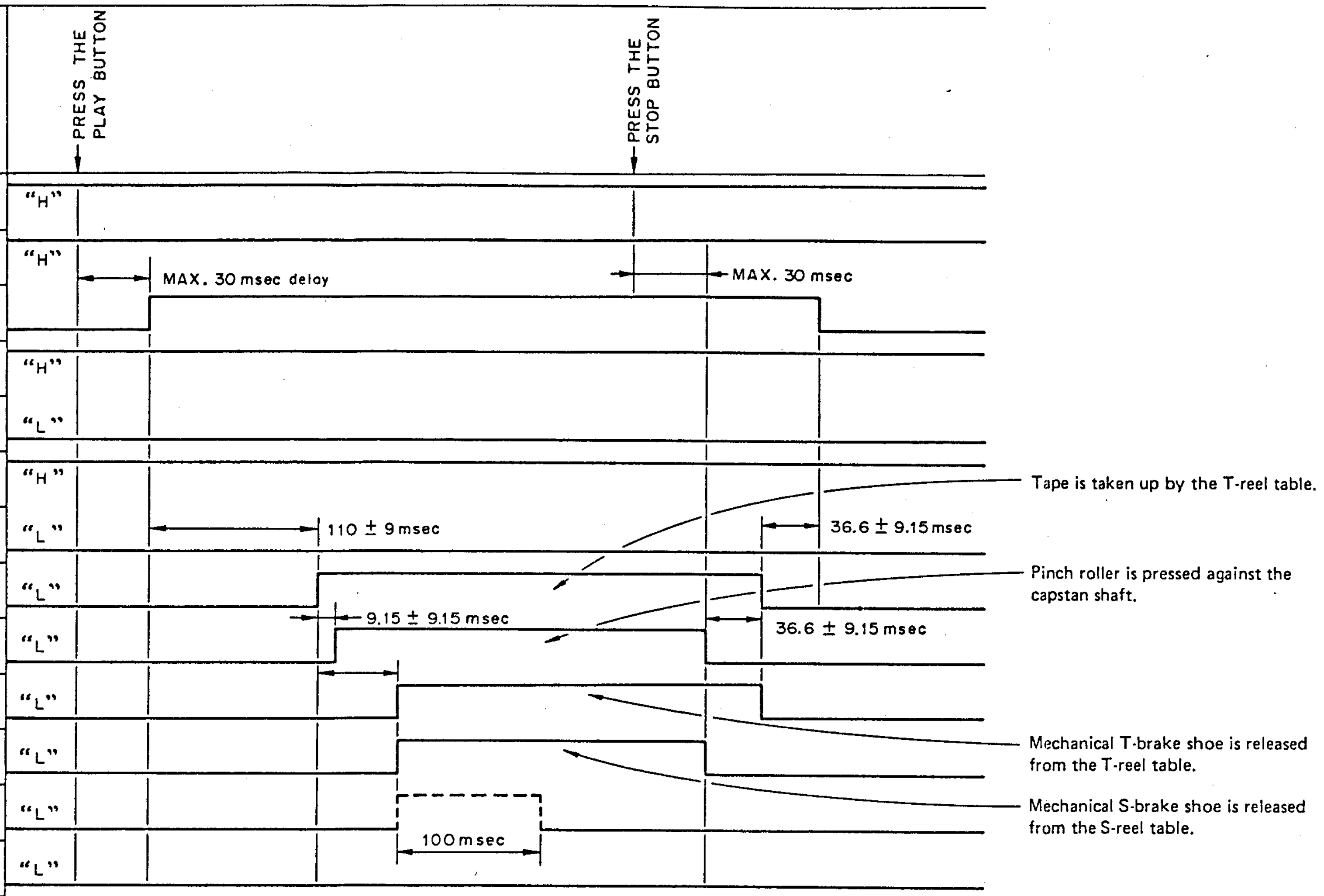
7-7. STANDBY OFF → STANDBY ON (DRUM STOP → DRUM ROTATE)

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
CAPSTAN MOTOR ON	L ; CAPSTAN MOTOR ON	SY - 22 IC5-17	02
DRUM ON	L; DRUM ON	SY - 22 IC9-16	05
DRUM ROTATE	H ; DRUM ROTATE	SY - 18 IC2-12	0H



7-8. STOP - PLAY - STOP

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
SERVO LOCK	H; SERVO LOCK	SY-18 IC2-20	OP
SEARCH	L; SEARCH	SY-18 IC2-1	06
TENREG. SOLENOID ON	H; TENREG. SOL. ON	SY-22 IC9-1	04
FWD / $\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY-18 IC2-2	06
DRUM AFC ON	H; DRUM AFC ON	SY-22 IC9-15	05
CAPSTAN SPEED 1		SY-18 IC2-8	08
CAPSTAN SPEED 0		SY-18 IC2-7	08
T-IDLER SOLENOID ON	H; T-IDLER SOL. ON	SY-22 IC9-22	04
PINCH SOLENOID ON	H; PINCH SOL. ON	SY-22 IC9-4	03
T-BRAKE ON	H; T-BRAKE ON	SY-22 IC9-5	03
S-BRAKE ON	H; S-BRAKE ON	SY-22 IC9-23	04
DRUM ON	L; DRUM ON	SY-22 IC9-16	05
CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY-22 IC5-17	02



Tape is taken up by the T-reel table.

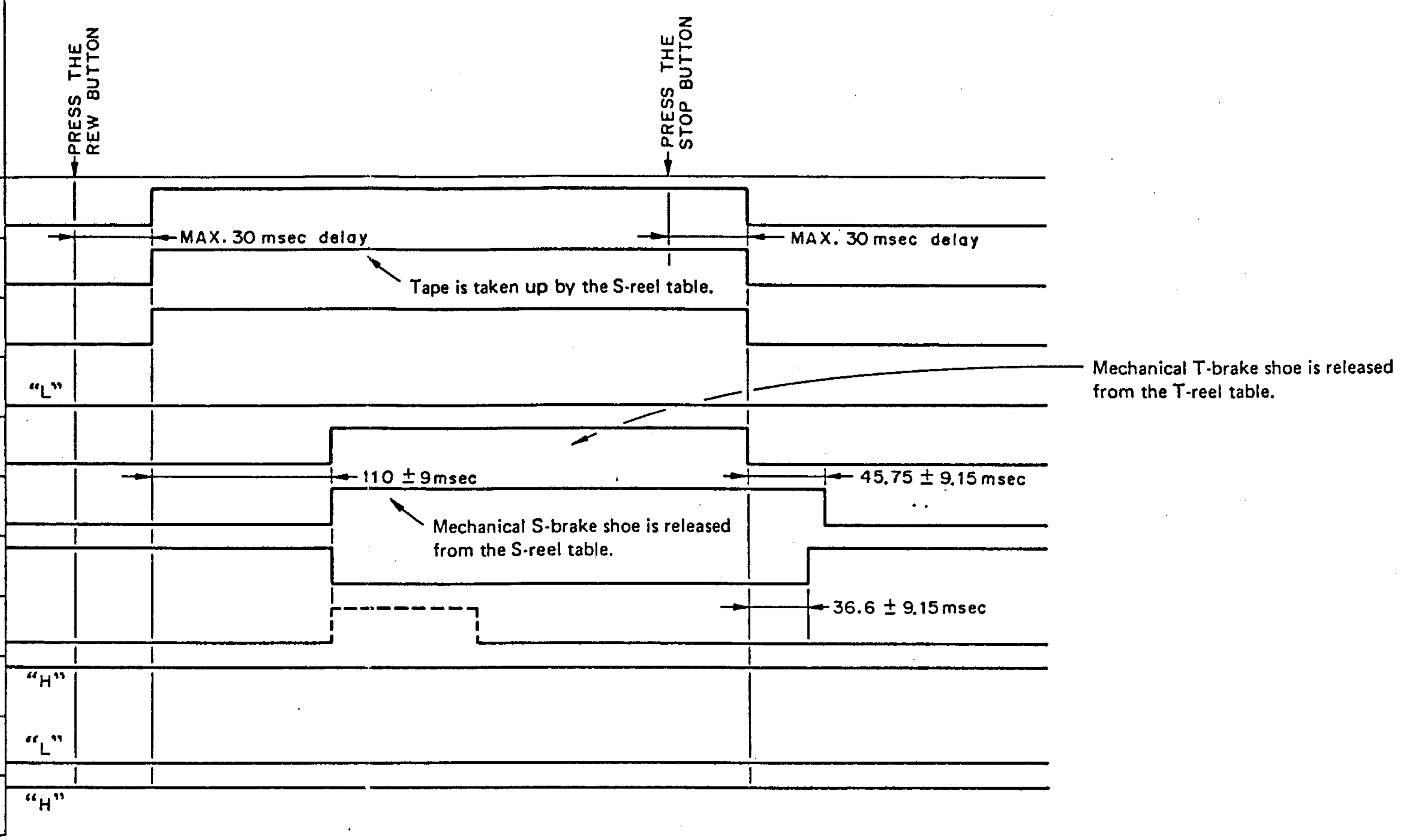
Pinch roller is pressed against the capstan shaft.

Mechanical T-brake shoe is released from the T-reel table.

Mechanical S-brake shoe is released from the S-reel table.

7-9. STOP - REW - STOP

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY - 22 IC5 - 17	02
S - IDLER SOLENOID ON	H; S - IDLER SOL. ON	SY - 22 IC9 - 21	04
DRUM AFC ON	H; DRUM AFC ON	SY - 22 IC9 - 15	05
PINCH SOLENOID ON	H; PINCH SOL. ON	SY - 22 IC9 - 4	03
T - BRAKE ON	H; T - BRAKE ON	SY - 22 IC9 - 5	03
S - BRAKE ON	H; S - BRAKE ON	SY - 22 IC9 - 23	04
FWD/$\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY - 18 IC2 - 2	06
DRUM ON	L; DRUM ON	SY - 22 IC9 - 16	05
CAPSTAN SPEED 1		SY - 18 IC2 - 8	08
CAPSTAN SPEED 0		SY - 18 IC2 - 7	08
SEARCH	L; SEARCH	SY - 18 IC2 - 1	06



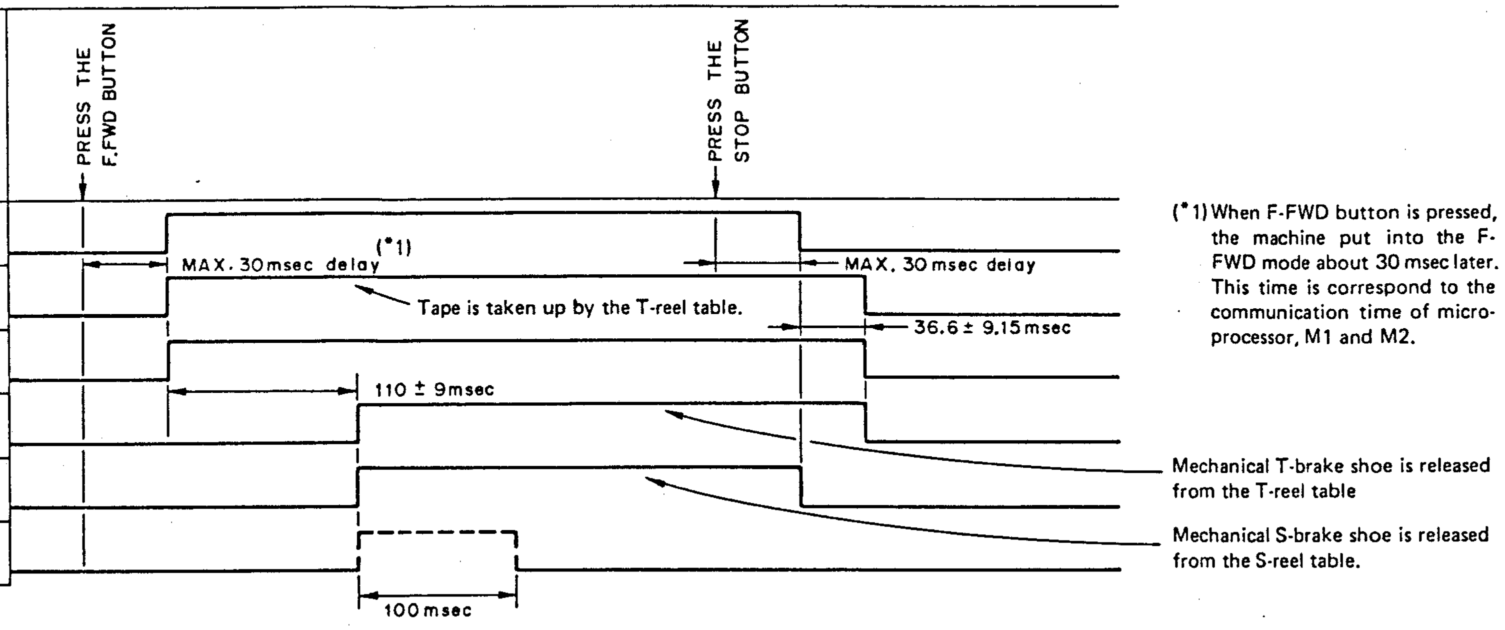
Tape is taken up by the S-reel table.

Mechanical T-brake shoe is released from the T-reel table.

Mechanical S-brake shoe is released from the S-reel table.

7-10. STOP-F·FWD-STOP

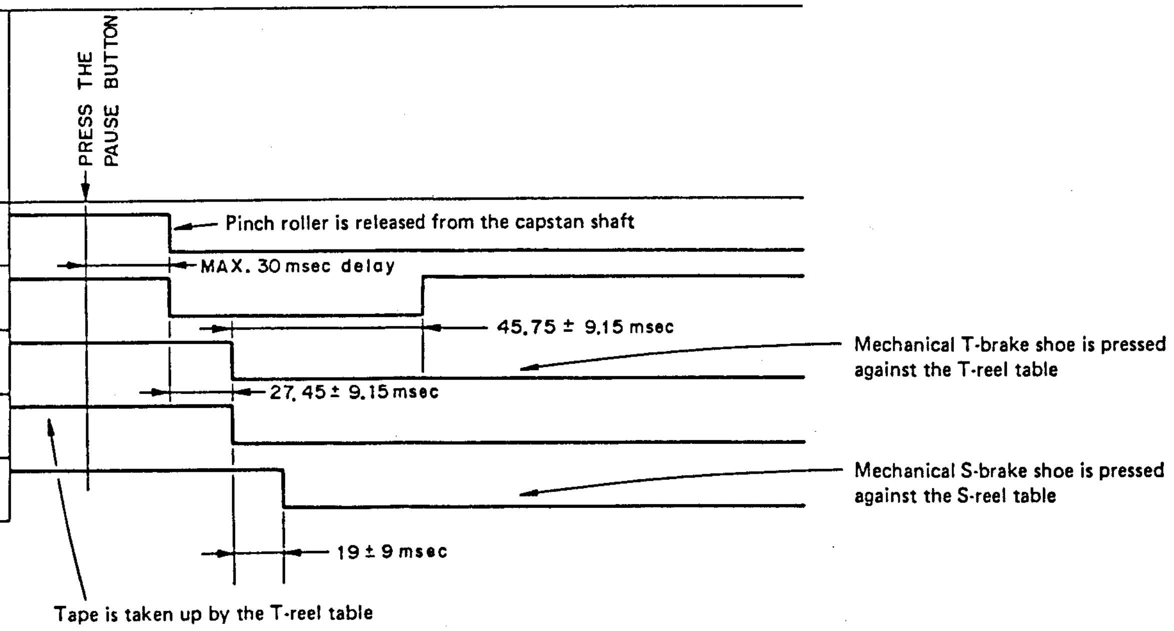
SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
CAPSTAN MOTOR ON	L; CAPSTAN MOTOR ON	SY – 22 IC5 – 17	02
T- IDLER SOLENOID ON	H; T-IDLER SOL. ON	SY – 22 IC9–22	04
DRUM AFC ON	H; DRUM AFC ON	SY – 22 IC9 – 15	05
T- BRAKE ON	H; T-BRAKE ON	SY –22 IC9 – 5	03
S - BRAKE ON	H; S-BRAKE ON	SY – 22 IC9 –23	04
DRUM ON	L; DRUM ON	SY –22 IC9 –16	05


PRESS THE F.FWD BUTTON
PRESS THE STOP BUTTON
MAX. 30msec delay
(*1)
MAX. 30 msec delay
Tape is taken up by the T-reel table.
36.6± 9.15msec
110 ± 9msec
Mechanical T-brake shoe is released from the T-reel table
Mechanical S-brake shoe is released from the S-reel table.
100msec

(*1) When F-FWD button is pressed, the machine put into the F-FWD mode about 30 msec later. This time is correspond to the communication time of micro-processor, M1 and M2.

7-11. PLAY - PLAY·PAUSE

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
PINCH SOLENOID ON	H; PINCH SOL. ON	SY – 22 IC9 – 4	03
TENREG. SOLENOID ON	H; TENREG. SOL. ON	SY – 22 IC9 – 1	04
T - BRAKE ON	H; T-BRAKE ON	SY- 22 IC9 – 5	03
T - IDLER SOLENOID ON	H; T-IDLER SOL. ON	SY – 22 IC9–22	04
S - BRAKE ON	H; S-BRAKE ON	SY– 22 IC9–23	04


PRESS THE PAUSE BUTTON
Pinch roller is released from the capstan shaft
MAX. 30 msec delay
45.75 ± 9.15 msec
Mechanical T-brake shoe is pressed against the T-reel table
27.45± 9.15msec
Mechanical S-brake shoe is pressed against the S-reel table
19±9msec
Tape is taken up by the T-reel table

7-12. REC → REC PAUSE → REC

When video CH-A and CH-B are cut off, the capstan rotates in reverse. When reverse rotation is detected, it turns to CAPSTAN REVERSE status and sets the capstan speed to one-third normal speed. At this moment the CTL counter is reset and three CTL pulses are counted.

At the third CTL, the capstan speed is reduced to one-sixth normal speed. At the fourth CTL count, the T-brake is on.

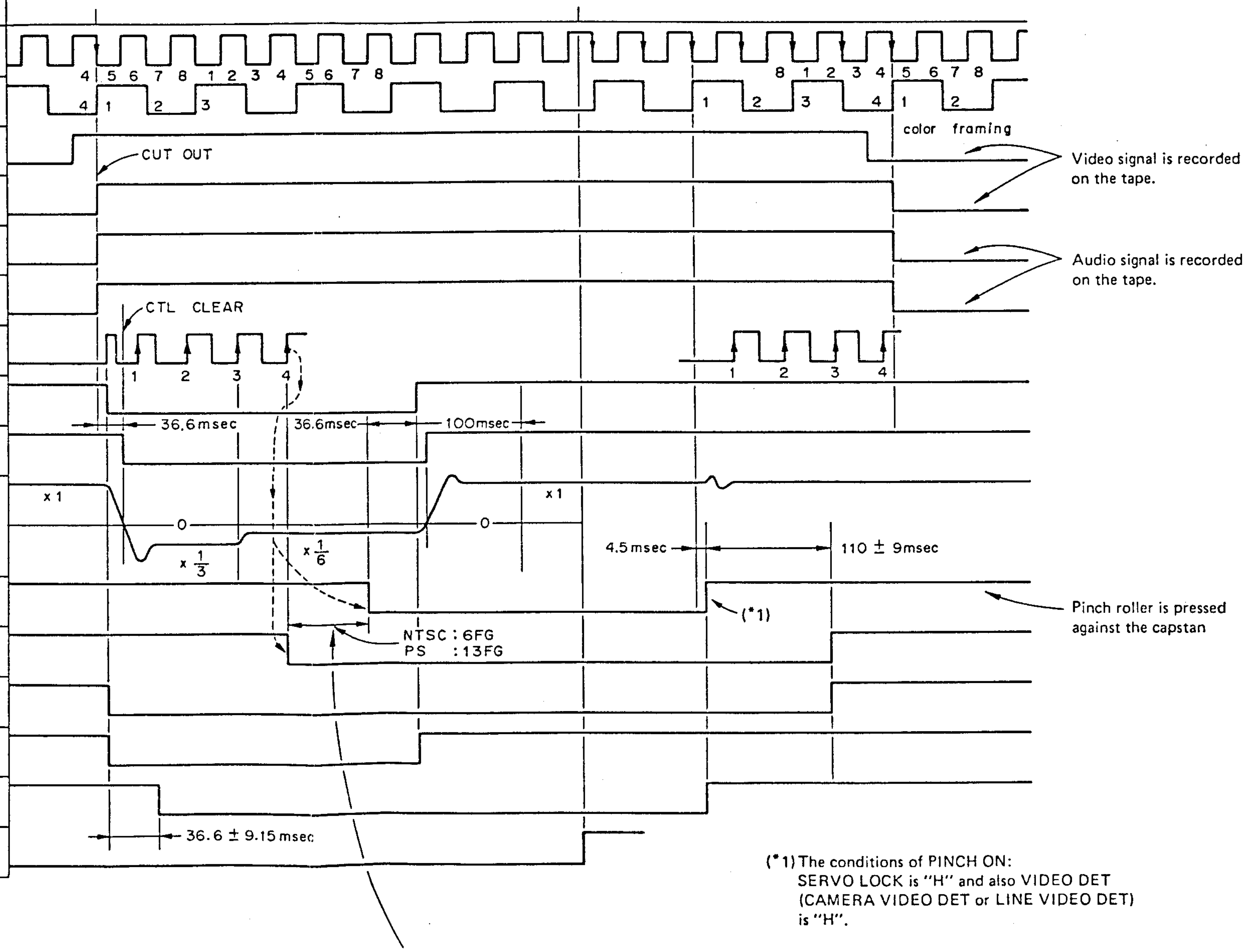
The pinch roller is disengaged when 6FG:NTSC (13FG:PAL) pulses are counted from the fourth CTL count.

Exactly 36ms after the pinch roller is disengaged, the capstan returns to normal speed from the reverse rotation and stands by for recording.

When the next recording is input, the pinch roller engages after 4.57ms, and recording starts at the fourth trailing edge of 1/2 VD.

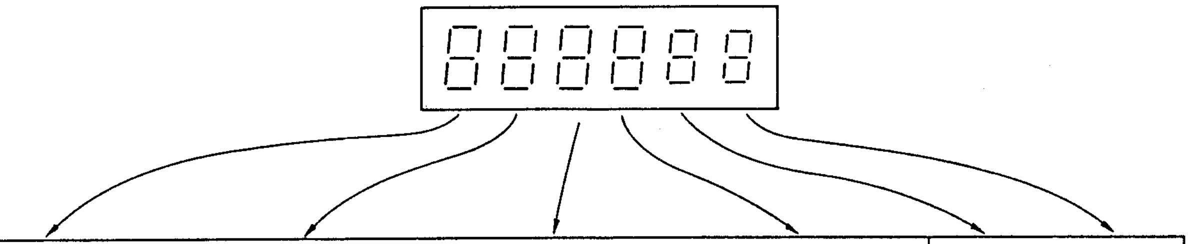
REC-REC/PAUSE-REC

SIGNAL		MEASURING POINT	LABEL NO. ON SELF-DIAGNOSTICS
1/2 VD		SY-18 IC2-34	OL
1/4 VD		-	02
VIDEO CH-B REC	L; VIDEO CH-B REC OUT	SY-22 IC5-19	02
VIDEO CH-A REC	L; VIDEO CH-A REC OUT	SY-22 IC5-20	01
AUDIO CH-1 REC	H; AUDIO CH-1 REC OUT	SY-22 IC5-1	01
AUDIO CH-2 REC	H; AUDIO CH-2 REC OUT	SY-22 IC5-23	0-
PB CTL		SY-22 IC2-39	06
FWD/$\overline{\text{REV}}$ COMMAND	H; FWD L; REV	SY-18 IC2-2	06
CAPSTAN REV STATUS			
CAPSTAN SPEED			
PINCH SOLENOID ON	H; PINCH SOL. ON	SY-22 IC9-4	03
T-BRAKE ON	H; T-BRAKE ON	SY-22 IC9-5	03
S-BRAKE ON	H; S-BRAKE ON	SY-22 IC9-23	04
SEARCH	L; SEARCH	SY-18 IC2-1	06
T-IDLER SOLENOID ON	H; T-IDLER SOL. ON	SY-22 IC9-22	04
CAMERA $\overline{\text{START}}$ / STOP	H; STOP L; START	SY-18 IC4-3	1U



(*1) The conditions of PINCH ON:
SERVO LOCK is "H" and also VIDEO DET (CAMERA VIDEO DET or LINE VIDEO DET) is "H".

FG count is displayed on the LCD display on the front panel in the self check mode. (See ref. sec. 2 - 15)
FG count is adjusted by RV2/SY-22 board.



	FIGURES OF DISPLAY				LABEL	
	1	2	3	4	5	6
IC2/SY-18 OUTPUT DATA	$\overline{\text{VIDEO MUTE}}$ $\binom{\text{SY-22}}{\text{IC5-5}}$	AUDIO MUTE $\binom{\text{SY-22}}{\text{IC5-4}}$	AUDIO CH-2 $\overline{\text{PB}}$/EE "0/1" $\binom{\text{SY-22}}{\text{IC5-3}}$	AUDIO CH-1 $\overline{\text{PB}}$/EE "0/1" $\binom{\text{SY-22}}{\text{IC5-2}}$	0	0
		VIDEO PB/$\overline{\text{EE}}$ "1/0" $\binom{\text{SY-22}}{\text{IC5-22}}$	$\overline{\text{AUDIO CH-2 REC}}$ $\binom{\text{SY-22}}{\text{IC5-23}}$	$\overline{\text{AUDIO CH-1 REC}}$ $\binom{\text{SY-22}}{\text{IC5-1}}$	0	1
	$\overline{\text{CAPSTAN MOTOR ON}}$ $\binom{\text{SY-22}}{\text{IC5-17}}$		$\overline{\text{VIDEO CH-B REC}}$ $\binom{\text{SY-22}}{\text{IC5-19}}$	$\overline{\text{VIDEO CH-A REC}}$ $\binom{\text{SY-22}}{\text{IC5-20}}$	0	2
	T-BRAKE SOL. ON $\binom{\text{SY-22}}{\text{IC9-5}}$	PINCH SOL. ON $\binom{\text{SY-22}}{\text{IC9-4}}$	UNTHREAD MOTOR ON $\binom{\text{SY-22}}{\text{IC9-3}}$	THREAD MOTOR ON $\binom{\text{SY-22}}{\text{IC9-2}}$	0	3
	S-IDLER SOL. ON $\binom{\text{SY-22}}{\text{IC9-21}}$	T-IDLER SOL. ON $\binom{\text{SY-22}}{\text{IC9-22}}$	S-BRAKE SOL. ON $\binom{\text{SY-22}}{\text{IC9-23}}$	TENREG. SOL. ON $\binom{\text{SY-22}}{\text{IC9-1}}$	0	4
	$\overline{\text{DRUM ON}}$ $\binom{\text{SY-22}}{\text{IC9-16}}$	DRUM AFC ON $\binom{\text{SY-22}}{\text{IC9-15}}$			0	5
	FWD/$\overline{\text{REV}}$ COMMAND $\binom{\text{SY-18}}{\text{IC2-2}}$	$\overline{\text{SEARCH}}$ $\binom{\text{SY-18}}{\text{IC2-1}}$		$\overline{\text{IC2 READY}}$ $\binom{\text{SY-18}}{\text{IC2-47}}$	0	6
		TEST INT OUT $\binom{\text{SY-18}}{\text{IC2-5}}$	$\overline{\text{PB}}$ $\binom{\text{SY-18}}{\text{IC2-4}}$		0	7
			CAPSTAN SPEED 1 $\binom{\text{SY-18}}{\text{IC2-8}}$	CAPSTAN SPEED 0 $\binom{\text{SY-18}}{\text{IC2-7}}$	0	8

The following table shows the signals to be displayed on LCD in each label number.

	FIGURES OF DISPLAY				LABEL	
	1	2	3	4	5	6
IC2/SY-18 INPUT DATA	TAPE PROTECTION $\binom{\text{SY-22}}{\text{IC9-17}}$	"1" $\binom{\text{SY-22}}{\text{IC9-18}}$	$\overline{\text{SELF CHECK MODE}}$ $\binom{\text{SY-22}}{\text{IC9-19}}$	$\overline{\text{AUTO STOP: OFF}}$ (*NOTE-4) $\binom{\text{SY-22}}{\text{IC9-20}}$	0	9
	$\overline{\text{TEN-REG. SW ON}}$ $\binom{\text{SY-18}}{\text{IC2-35}}$	1/2 VD $\binom{\text{SY-18}}{\text{IC2-34}}$		BACK SPACE EDIT START $\binom{\text{SY-18}}{\text{IC2-32}}$	0	L
	REEL STOP STATUS $\binom{\text{SY-18}}{\text{IC2-15}}$	CAPSTAN FWD/$\overline{\text{REV}}$ "1/0" $\binom{\text{SY-18}}{\text{IC2-14}}$	CAPSTAN ROTATE $\binom{\text{SY-18}}{\text{IC2-13}}$	DRUM ROTATE $\binom{\text{SY-18}}{\text{IC2-12}}$	0	H
			$\overline{\text{VIDEO DET.}}$ $\binom{\text{SY-18}}{\text{IC2-21}}$	SERVO LOCK $\binom{\text{SY-18}}{\text{IC2-20}}$	0	P
	CS1 $\binom{\text{SY-22}}{\text{IC5-16}}$	CS0 $\binom{\text{SY-22}}{\text{IC5-15}}$	PINCH ON STATUS $\binom{\text{SY-22}}{\text{IC5-14}}$	REEL STATUS "1": LARGE HUB" "0": SMALL HUB" $\binom{\text{SY-22}}{\text{IC5-13}}$	0	R
	← CTL COUNT WHEN BACK SPACE EDITING →				0	—
	← CTL COUNT WHEN BACK SPACE EDITING →				0	(BLANK)
IC1/SY-18 OUTPUT DATA	FF LAMP $\binom{\text{SY-18}}{\text{IC7-5}}$	PLAY LAMP $\binom{\text{SY-18}}{\text{IC7-4}}$	T-LED ON $\binom{\text{SY-18}}{\text{IC7-3}}$	S-LED ON $\binom{\text{SY-18}}{\text{IC7-2}}$	1	0
	DUB LAMP $\binom{\text{SY-18}}{\text{IC7-21}}$	REC LAMP $\binom{\text{SY-18}}{\text{IC7-22}}$	FF/REW $\binom{\text{SY-18}}{\text{IC7-23}}$	REW LAMP $\binom{\text{SY-18}}{\text{IC7-1}}$	1	1
	CHARACTER GEN. MUTE $\binom{\text{SY-18}}{\text{IC7-17}}$	8P MONITOR DET. $\binom{\text{SY-18}}{\text{IC7-18}}$	$\overline{\text{REC FWD}}$ $\binom{\text{SY-18}}{\text{IC7-19}}$	PAUSE LAMP $\binom{\text{SY-18}}{\text{IC7-20}}$	1	2
	$\overline{\text{ADDRESS SET STROBE}}$ $\binom{\text{SY-18}}{\text{IC1-6}}$	DISPLAY DATA CTL/$\overline{\text{TC}}$ "1/0" $\binom{\text{SY-18}}{\text{IC1-5}}$		TC WRITE EN $\binom{\text{SY-18}}{\text{IC1-3}}$	1	3
	TAPE END LAMP $\binom{\text{SY-18}}{\text{IC8-5}}$	DOC ON $\binom{\text{SY-18}}{\text{IC8-4}}$	SERVO LAMP $\binom{\text{SY-18}}{\text{IC8-3}}$	SLACK LAMP $\binom{\text{SY-18}}{\text{IC8-2}}$	1	4
	REC FWD $\binom{\text{SY-18}}{\text{IC8-21}}$	ALARM TONE $\binom{\text{SY-18}}{\text{IC8-22}}$	BATTERY ALARM $\binom{\text{SY-18}}{\text{IC8-23}}$	BATTERY END LAMP $\binom{\text{SY-18}}{\text{IC8-1}}$	1	5

	FIGURES OF DISPLAY				LABEL	
	1	2	3	4	5	6
OUTPUT DATA	REC FWD PAUSE (SY-18 IC8-17)		POWER CONT (SY-18 IC8-19)	POWER SAVE (SY-18 IC8-20)	1	6
	BACK SPACE EDIT START (SY-18 IC1-10)	CPU RESET ENABLE (SY-18 IC1-9)	RAM DATA IN/OUT "0/1" (SY-18 IC1-8)	CAMERA RESET (SY-18 IC1-7)	1	7
SOFT STATUS					1	8
					1	9
	← *NOTE 9 →				1	L
IC1/SY-18 INPUT DATA	IC2 READY (SY-18 IC1-23)	TC 1/2 VD (SY-18 IC1-22)	INPUT STROBE (SY-18 IC1-21)	TAPE FWD/REV "1/0" (SY-18 IC1-20)	1	H
	CTL BACKUP ENABLE (SY-18 IC8-10)	SAVE/STPBY "1/0" (SY-18 IC8-11)		CTL DROP DET. (SY-18 IC8-13)	1	P
	FF KEY (SY-18 IC6-1)	PLAY KEY (SY-18 IC5-1)	REW KEY (SY-18 IC4-1)	STOP KEY (SY-18 IC3-1)	1	R
	DUB KEY (SY-18 IC6-2)	REC KEY (SY-18 IC5-2)	"1" (SY-18 IC4-2)	PAUSE KEY (SY-18 IC3-2)	1	—
	LOCAL/REMOTE "1/0" (SY-18 IC6-3)	COUNTER RESET (SY-18 IC5-3)	CAMERA START/STOP "0/1" (SY-18 IC4-3)	EJECT SW (SY-18 IC3-3)	1	(BLANK)
	UNTHREAD END (SY-18 IC6-4)	THREAD END (SY-18 IC5-4)	CASSETTE LOCK (SY-18 IC4-4)	CASSETT IN (SY-18 IC3-4)	2	0
	TAPE END (SY-18 IC6-5)	TAPE TOP (SY-18 IC5-5)	8P MONITOR (SY-18 IC4-5)	MISS REC SW (SY-18 IC3-5)	2	1
	LOCAL INHIBIT (SY-18 IC6-6)	HUMID (SY-18 IC5-6)	BATTERY END (SY-18 IC4-6)	BATTERY BEFORE END (SY-18 IC3-6)	2	2

	FIGURES OF DISPLAY				LABEL	
	1	2	3	4	5	6
INPUT	REMOCON D3 (SY-18 IC6-7)	REMOCON D2 (SY-18 IC5-7)	REMOCON D1 (SY-18 IC4-7)	REMOCON D0 (SY-18 IC3-7)	2	3
	NTSC / PAL "1/0" (SY-18 IC6-9)	REMOCON STANDBY (SY-18 IC5-9)	REMOCON D5 (SY-18 IC4-9)	REMOCON D4 (SY-18 IC3-9)	2	4
	"0"	"0"	REEL DET	DRUM ROT DET	2	5
	CTL/TC SW "1/0" (SY-18 IC7-16)	GEN/PB "1/0" (SY-18 IC7-15)	TC EXIST (SY-18 IC7-14)	TAPE BEFORE END (SY-18 IC7-13)	2	6

NOTE-9;

DISPLAYED DATA	CAUSE OF SLACK
0000 1L	Normal
0001 1L	The UNTHREAD END signal is not excuted after 10sec passed in the UNLOAD mode, or the THREAD END signal is not excuted after 10sec passed in the LOAD mode.
0011 1L	The capstan does not rotate reversely.
1001 1L	The REEL STOP signal is not produced after 2sec passed. The TEN REG switch is not turned on in the tension release mode.
1010 1L 1011 1L	Reel rotation is not good.

8. Recording timing

The basic of the REC timing is shown in the timing chart. When recording starts, a VIDEO PB/EE signal goes to EE and REG 10.5V is supplied to the video circuit board.
System control waits two seconds for the video circuit to be ready.

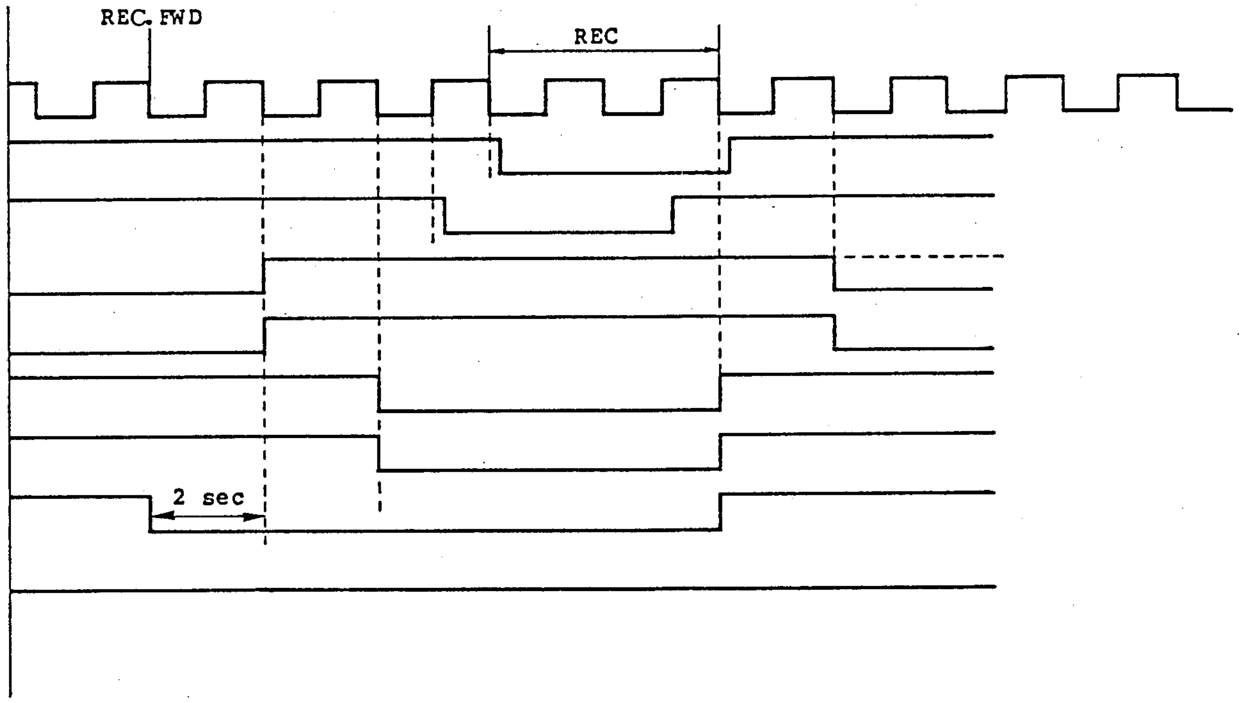
Next, at the falling edge of 1/2 VD (B), the AUDIO PB/EE signal(CH-1, CH-2) goes to EE mode. At the falling edge of 1/2 VD (A), the AUDIO REC (CH-1, CH-2) are on.

Then, the VIDEO CH-B REC comes on; and after a half cycle of 1/2 VD, the VIDEO CH-A REC comes on.

When recording is over, the video stops with the same procedure as recording but in reverse.

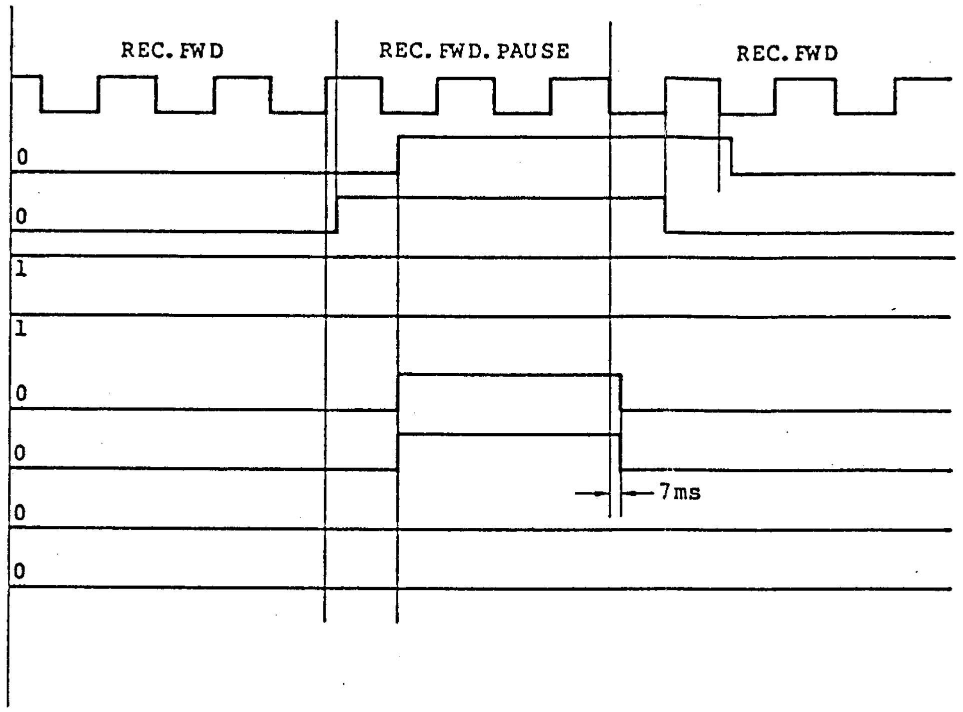
8-1. STOP → REC FWD → FWD

SIGNAL		measuring point
1/2 VD		
VIDEO CH-A REC	L:VIDEO CH-A REC	IC5-20
VIDEO CH-B REC	L:VIDEO CH-B REC	IC5-19
AUDIO CH-1 $\overline{PB}$/EE	L:PB H:EE	IC5-2
AUDIO CH-2 $\overline{PB}$/EE	L:PB H:EE	IC5-3
AUDIO CH-1 REC	L:AUDIO CH-1 REC	IC5-1
AUDIO CH-2 REC	L:AUDIO CH-2 REC	IC5-23
VIDEO PB/$\overline{EE}$	L:EE H:PB	IC5-22
AUDIO MUTE	H:AUDIO MUTE	IC5-4
		On the SY-22 board



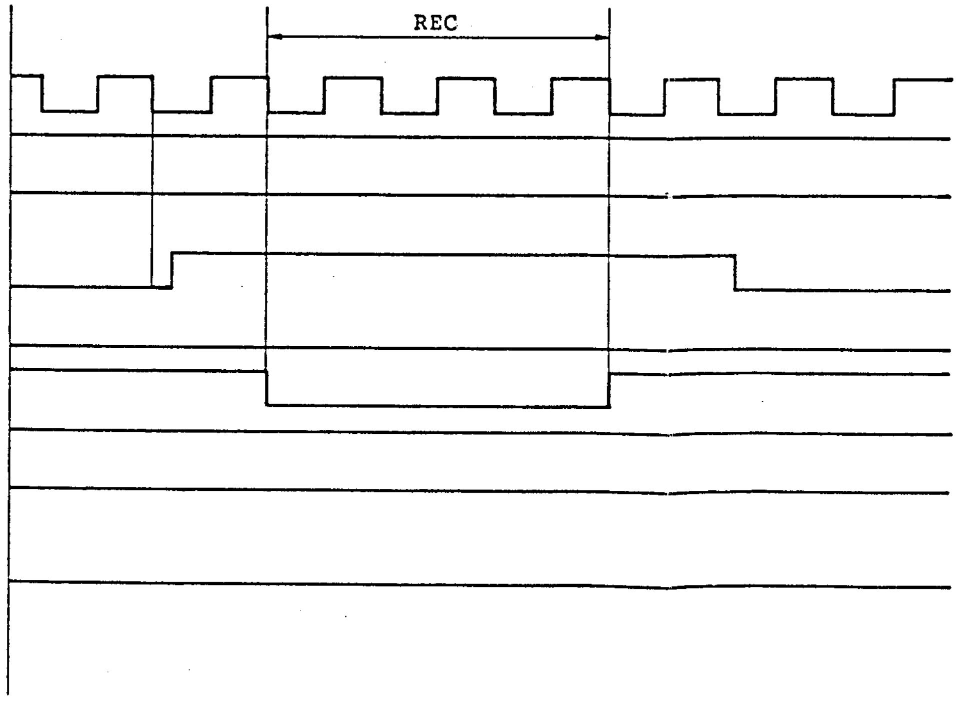
8-2. REC FWD → REC FWD PAUSE → REC FWD

SIGNAL		measuring point
1/2 VD		
VIDEO CH-A REC	L:VIDEO CH-A REC	IC5-20
VIDEO CH-B REC	L:VIDEO CH-B REC	IC5-19
AUDIO CH-1 $\overline{PB}$/EE	L:PB H:EE	IC5-2
AUDIO CH-2 $\overline{PB}$/EE	L:PB H:EE	IC5-3
AUDIO CH-1 REC	L:AUDIO CH-1 REC	IC5-1
AUDIO CH-2 REC	L:AUDIO CH-2 REC	IC5-23
VIDEO PB/$\overline{EE}$	L:EE H:PB	IC5-22
AUDIO MUTE	H:AUDIO MUTE	IC5-4
		On the SY-22 board



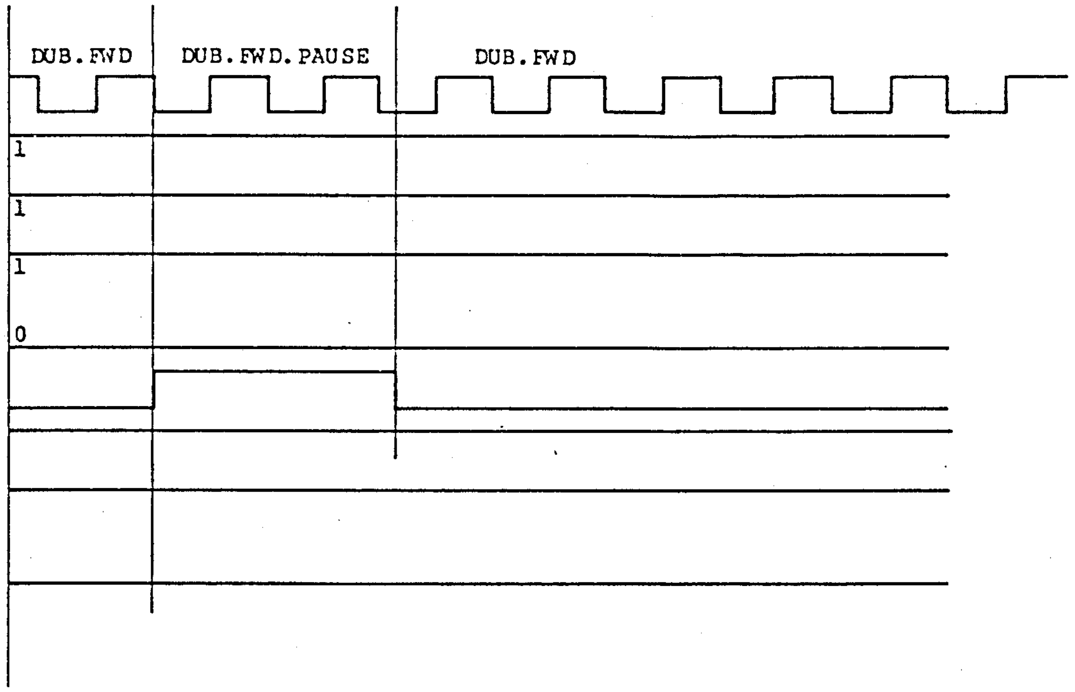
8-3. STOP → DUB FWD → FWD

SIGNAL		measuring point
1/2 VD		
VIDEO CH-A REC	L:VIDEO CH-A REC	IC5-20
VIDEO CH-B REC	L:VIDEO CH-B REC	IC5-19
AUDIO CH-1 $\overline{PB}$/EE	L:PB H:EE	IC5-2
AUDIO CH-2 $\overline{PB}$/EE	L:PB H:EE	IC5-3
AUDIO CH-1 REC	L:AUDIO CH-1 REC	IC5-1
AUDIO CH-2 REC	L:AUDIO CH-2 REC	IC5-23
VIDEO PB/$\overline{EE}$	L:EE H:PB	IC5-22
AUDIO MUTE	H:AUDIO MUTE	IC5-4
		On the SY-22 board



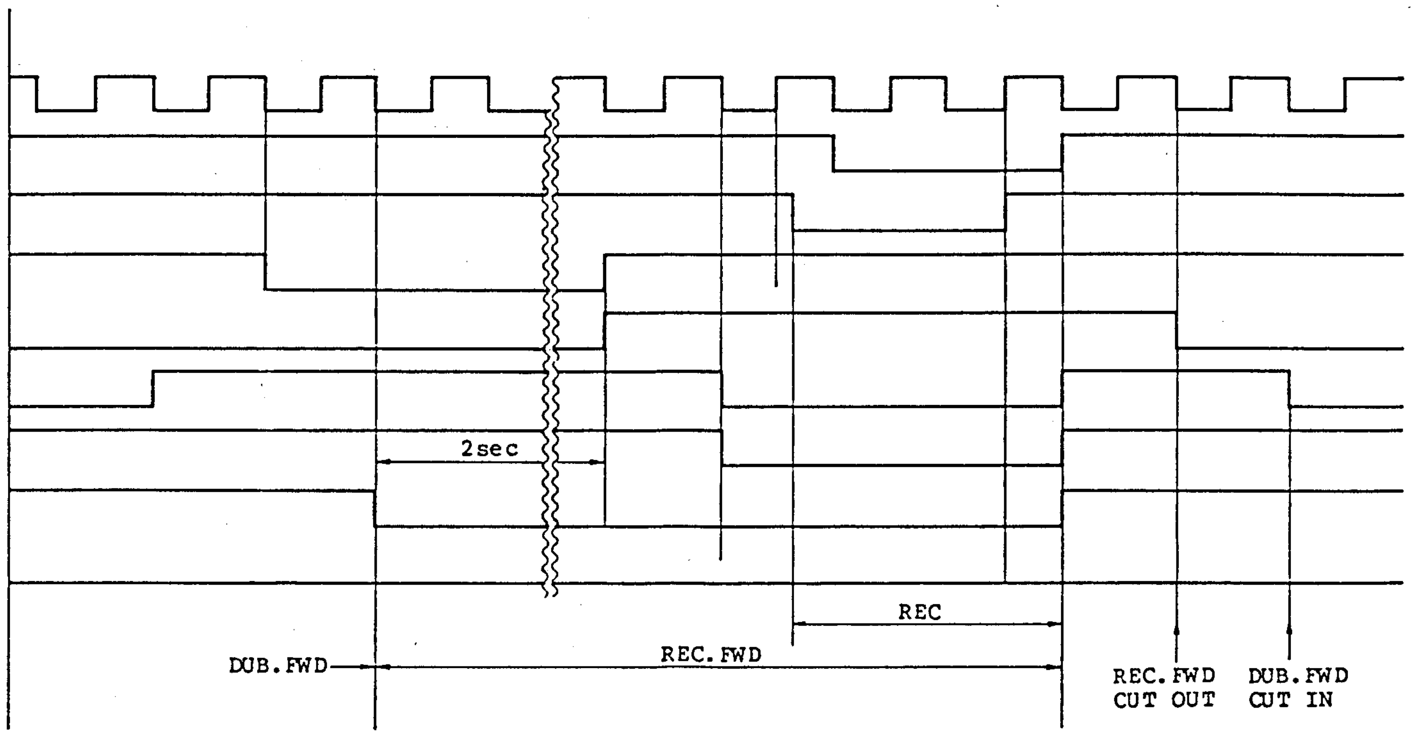
8-4. DUB FWD → DUB FWD PAUSE → DUB FWD

SIGNAL		measuring point
1/2 VD		
VIDEO CH-A REC	L:VIDEO CH-A REC	IC5-20
VIDEO CH-B REC	L:VIDEO CH-B REC	IC5-19
AUDIO CH-1 $\overline{PB}$/EE	L:PB H:EE	IC5-2
AUDIO CH-2 $\overline{PB}$/EE	L:PB H:EE	IC5-3
AUDIO CH-1 REC	L:AUDIO CH-1 REC	IC5-1
AUDIO CH-2 REC	L:AUDIO CH-2 REC	IC5-23
VIDEO PB/$\overline{EE}$	L:EE H:PB	IC5-22
AUDIO MUTE	H:AUDIO MUTE	IC5-4
		On the SY-22 board



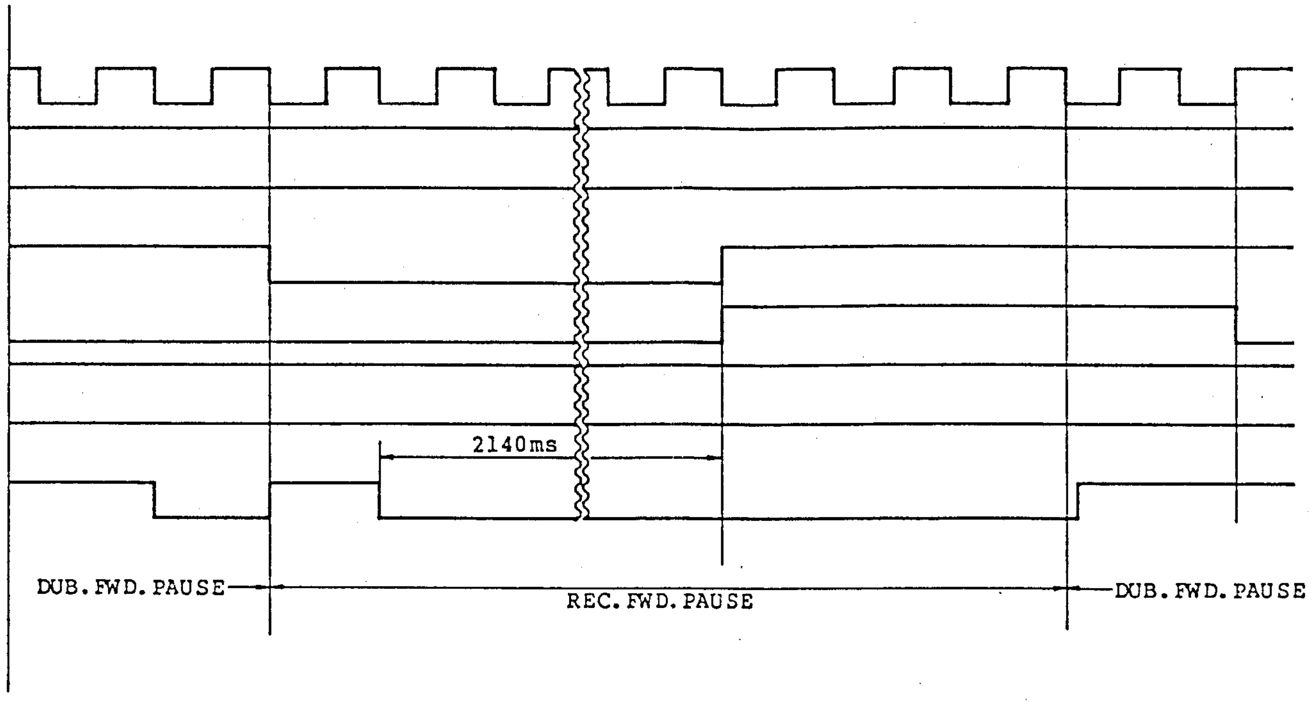
8-5. DUB FWD → REC FWD → DUB FWD

SIGNAL		measuring point
1/2 VD		
VIDEO CH-A REC	L:VIDEO CH-A REC	IC5-20
VIDEO CH-B REC	L:VIDEO CH-B REC	IC5-19
AUDIO CH-1 $\overline{PB}$/EE	L:PB H:EE	IC5-2
AUDIO CH-2 $\overline{PB}$/EE	L:PB H:EE	IC5-3
AUDIO CH-1 REC	L:AUDIO CH-1 REC	IC5-1
AUDIO CH-2 REC	L:AUDIO CH-2 REC	IC5-23
VIDEO PB/$\overline{EE}$	L:EE H:PB	IC5-22
AUDIO MUTE	H:AUDIO MUTE	IC5-4
		On the SY-22 board



8-6. DUB FWD PAUSE →REC FWD PAUSE →DUB FWD PAUSE

SIGNAL		measuring point
1/2 VD		
VIDEO CH-A REC	L:VIDEO CH-A REC	IC5-20
VIDEO CH-B REC	L:VIDEO CH-B REC	IC5-19
AUDIO CH-1 $\overline{PB}$/EE	L:PB H:EE	IC5-2
AUDIO CH-2 $\overline{PB}$/EE	L:PB H:EE	IC5-3
AUDIO CH-1 REC	L:AUDIO CH-1 REC	IC5-1
AUDIO CH-2 REC	L:AUDIO CH-2 REC	IC5-23
VIDEO PB/$\overline{EE}$	L:EE H:PB	IC5-22
AUDIO MUTE	H:AUDIO MUTE	IC5-4
		On the SY-22 board



SECTION 9

POWER SUPPLY AND SYSTEM CONTROL ALIGNMENT

[Equipment Required]

- DC Voltmeter
- Oscilloscope
- AC adaptor (AC-500CE)
  NOTE: AC-500CE DC Output is 13 Vdc.
- FILTER : Kodak Wratten gelatin filter
  No. 96 N.D. 0.60
  No. 96 N.D. 2.00
  Use the N.D. Filters one over the other.

9-1. REG +10.5 V ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• DC IN 12V connector; +12V±0.02V • PLAY mode.	TP6/PSB-4 10.52V±0.005Vdc	⊘ RV3/PSB-4

NOTE: If the REG 10.5V adjustment is attempted, re-alignment of the video system and servo system are required.
Do not attempt adjustment to the REG 10.5V power supply unless machine performance is obviously poor due to incorrect power supply voltage. If adjustments are made to the power supply, re-alignment of the video and servo systems are necessary.

9-2. PB +10.5 V ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• DC IN 12V connector; +12V±0.02V • PLAY mode	TP7/PSB-4 10.50V±0.005Vdc	⊘ RV4/PSB-4

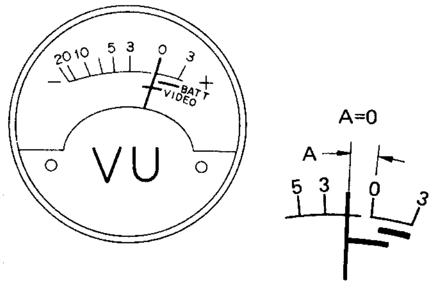
9-3. REG +5 V ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• DC IN 12V connector; +12V± 0.02V • PLAY mode.	TP5/PSB-4 5.00 V ± 0.05 Vdc	⊘ RV2/PSB-4

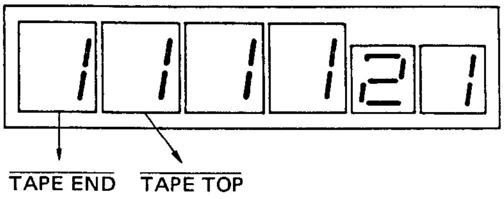
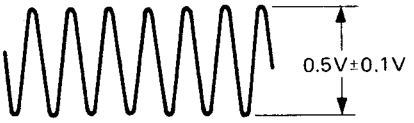
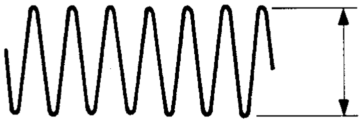
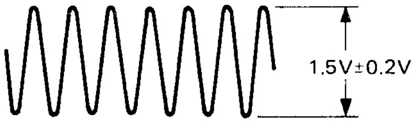
9-4. EVER +5 V ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• DC IN 12V connector; +12V± 0.02V • STOP mode	TP11/PSB-4 $5.10\ V^{+0.1}_{-0}$ Vdc	⊘ RV1/PSB-4

9-5. BATTERY METER CALIBRATION ADJUSTMENT

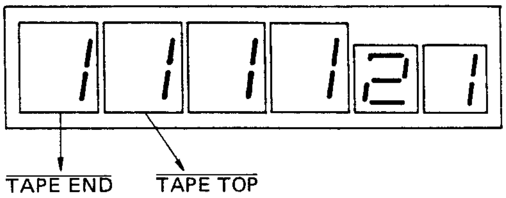
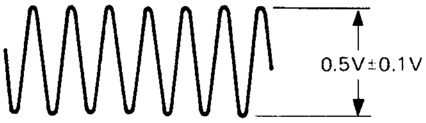
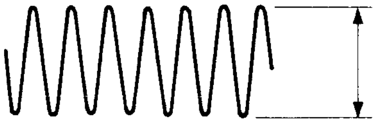
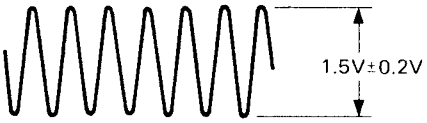
machine conditions for adjustment	spec.	adjustment
• DC IN 12V connector; EXT DC (At TP13/PSB-4; 11.0V±0.02 Vdc) • PLAY mode. • METER SELECT SW; BATT	BATTERY meter  20 10 5 3 0 3 – + BATT VIDEO VU A=0 A 5 3 0 3	⊘ RV6/PSB-4

9-6. TAPE BEGINNING SENSOR ADJUSTMENT

machine conditions for adjustment	**Spec.**	**adjustment**
• STOP mode. • SW1/SY-22; ON	counter set TAPE COUNTER 	⊘ RESET button (Control Panel)
• Temporarily set the RV3/SY-18 board fully CCW. • Put the machine into thread-end mode without inserting a cassette tape. • Insert the filter between DUS-5 and LE-20 board (Tape beginning detector). • Push the CASSETTE IN SW. • PLAY mode.	preset TP3/SY-18 	⊘ RV2/SY-18 TRIG; TP3/SY-18
	tuning TP3/SY-18 Maximize this level	⊘ LV1/SY-18 TRIG; TP3/SY-18
	bignning sensor adj. TP3/SY-18 	⊘ RV2/SY-18 TRIG; TP3/SV-18

NOTE: After completed this adjustment, adjust Sec. 9-7 TAPE END SENSOR ADJ.

9-7. TAPE END SENSOR ADJUSTMENT

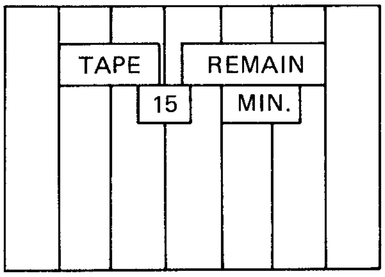
machine conditions for adjustment	spec.	adjustment
• STOP mode. • SW1/SY-22; ON	counter set TAPE COUNTER 	⊘ RESET button (Control Panel)
• Put the machine into thread-end mode without inserting a cassette tape. • Insert the filter between DUS-5 and LE-21 board (Tape end detector). • Push the CASSETTE IN SW. • STOP mode.	preset TP4/SY-18 	⊘ RV3/SY-18 TRIG; TP4/SY-18
	tuning TP4/SY-18  Maximize this level	⊘ LV2/SY-18 TRIG; TP4/SY-18
	end sensor adj. TP4/SY-18 	⊘ RV3/SY-18 TRIG; TP4/SY-18

NOTE: After completing this adjustment, adjust the Sec. 9-6. TAPE BEGINNING SENSOR ADJ.

9-8. BATTERY END LEVEL DETECTOR ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• DC IN 12V connector; EXT DC • Connect the CAMERA. • REC mode.	TP13/PS-42 11.28 V ± 0.01 Vdc	EXT DC Voltage
	⇩ TP5/SY-18 Adjust RV1/SY-18 so that the level changes from Low level to High level.	⊘ RV1/SY-18

9-9. CHARACTER SIZE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• CAMERA connector; Connect the Video Camera. • CAMERA OUTPUT; Color bar signal • REC mode. • Press the Return Video button on the Camera.	Viewfinder screen on the camera  Adjust RV1/SY-22 so that the characters are positioned at the following.	⊘ RV1/SY-22

9-10. PINCH OFF DELAY ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Any mode.	Set to fully CW.	⊘ RV2/SY-22

SECTION 10

SERVO SYSTEM ALIGNMENT

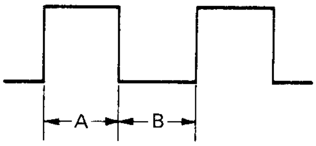
[Equipment Required]

- Dual Trace Oscilloscope.
- Frequency Counter.
- Alignment Tape;
  RR5-1SD PAL (Parts No. 8-960-036-80) – SP tape –

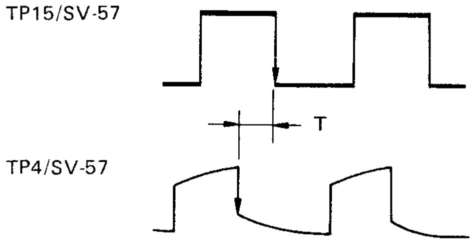
Time (min.)	Video	Audio	Time code
5	Color bars	–	–
3	Gated sweep (B/W)	1 kHz, 0 dB	–
3	Gated sweep (color)	10 kHz, –10 dB	–
3	Pulse & bar (MOD 10T and inverted 2T)	1 kHz, –20 dB (NR: OFF) 40 Hz, –20 dB (NR: OFF) 7 kHz, –20 dB (NR: OFF) 10 kHz, –20 dB (NR: OFF) 15 kHz, –20 dB (NR: OFF)	–
3	Monoscope (color)	1 kHz, –20 dB (NR: ON) 15 kHz, –20 dB (NR: ON)	–
3	Pseudo color bars	–	EBU Time code

- Blank Tape; KCS-20 (SONY standard product)

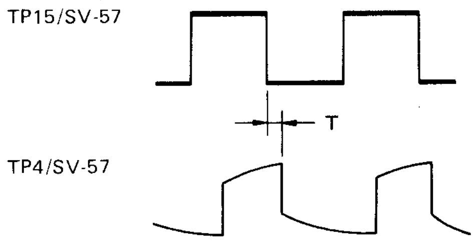
10-1. CAPSTAN FREE SPEED ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the color bar segment of Alignment tape.	TP12/SV-57  A = B	⊘ RV11/SV-57 TRIG; TP12/SV-57

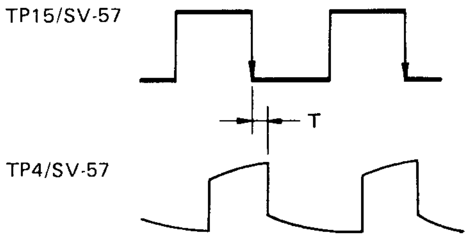
10-2. TRACKING MULTI ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the color bar segment of Alignment tape. • Set the TRACKING control to its center detent. • Oscilloscope; CHOP mode	 T = 0 ± 100 μsec	⊘ RV5/SV-57 TRIG; TP15/SV-57

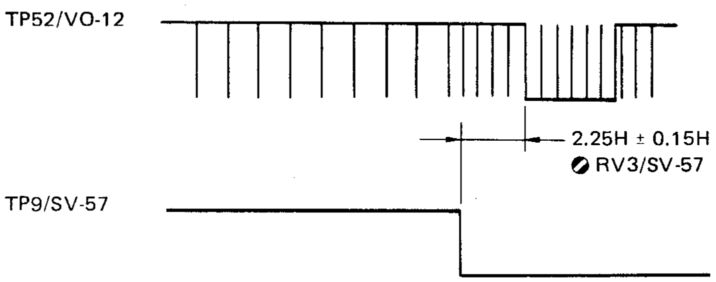
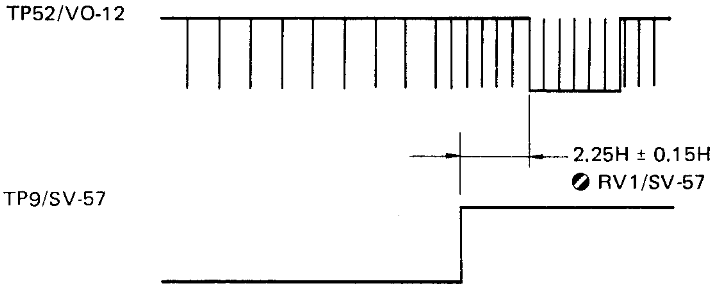
10-3. REC TRACKING ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN connector; Video signal. • Push the REC button in PLAY mode. • Oscilloscope; CHOP mode.	 $T = 200^{+50}_{-0}$ μsec	⊘ RV13/SV-57 TRIG; TP15/SV-57

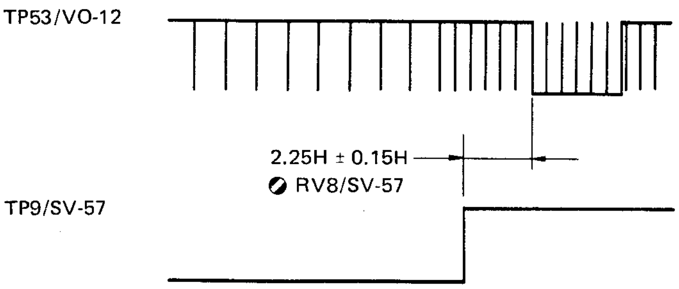
10-4. CAPSTAN FAST LOCK PHASE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Short TP14 – E1/SV-57. • Playing back the color bar segment of Alignment tape. • Oscilloscope; CHOP mode. • Set the TRACKING control to its center detent.	 T = 0.3 ± 0.05 ms (center of jitter)	⊘ RV12/SV-57 TRIG; TP15/SV-57

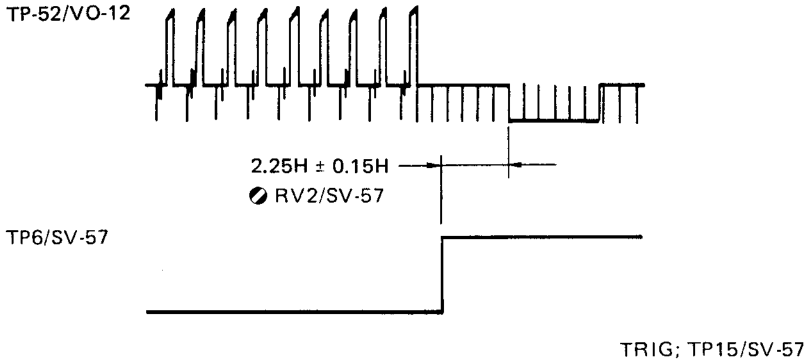
10-5. SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	**spec. & adjustment**
- Short TP3 – E1/SV-57. - Playing back the color bar segment of Alignment tape. - Oscilloscope; CHOP mode.	Switching Position —A adj  TRIG; TP15/SV-57
	Switching Position —B adj  TRIG; TP15/SV-57

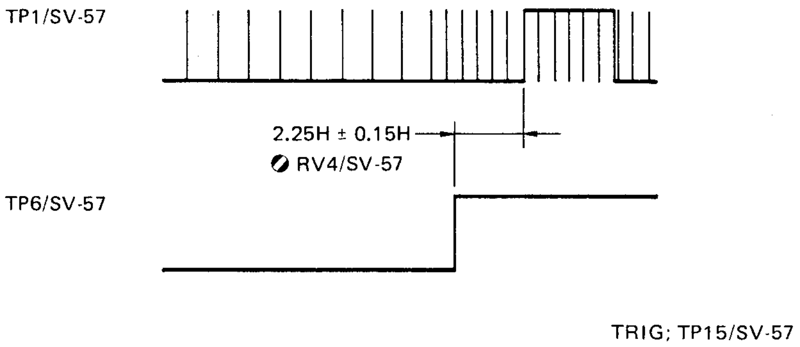
10-6. CONFI SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	**spec. & adjustment**
- VIDEO IN connector; Video signal. - REC mode. - Oscilloscope; CHOP mode.	 TRIG; TP15/SV-57

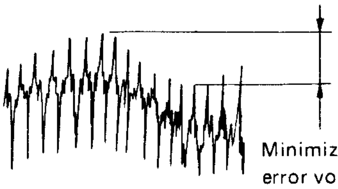
10-7. DRUM LOCK PHASE ADJUSTMENT

machine conditions for adjustment	**spec. & adjustment**
• VIDEO IN connector; Video signal. • Short TP2 – E1/SV-57. • REC mode. • Oscilloscope: CHOP mode.	 TP-52/VO-12 2.25H ± 0.15H ⊘ RV2/SV-57 TP6/SV-57 TRIG; TP15/SV-57

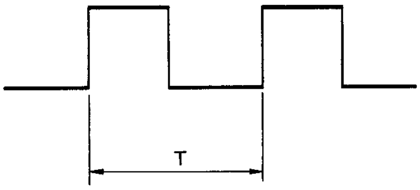
10-8. ϕ^2 PHASE ADJUSTMENT

machine conditions for adjustment	**spec. & adjustment**
• VIDEO IN connector; Video signal. • REC mode. • Oscilloscope; CHOP mode.	 TP1/SV-57 2.25H ± 0.15H ⊘ RV4/SV-57 TP6/SV-57 TRIG; TP15/SV-57

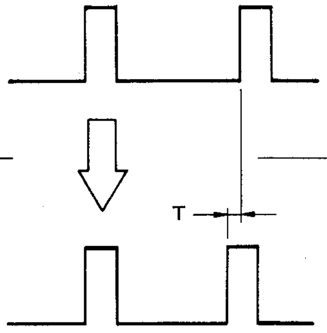
10-9. PICTURE SPLITTING COMPENSATOR ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the Alignment tape.	R106/SV-57  Minimize the error voltage	Phase adj. ⊘ RV6/SV-57 Level adj. ⊘ RV7/SV-57 TRIG; TP15/SV-57

10-10. REEL MOTOR SPEED ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the color bar segment of Alignment tape. • F FWD mode.	TP4/SV-57  T = 4.2 ± 0.1 msec (center of jitter)	⊘ RV14/SV-57 TRIG; TP3/SV-57

10-11. DRUM AFC BIAS ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• PLAY mode. • Short TP6—E1/SY-22.	TP3/SV-57 PLAY mode 	
• Short TP6 – E1/SY-22. • Connect between TP7 and TP18/SV-57 by 100Ω resistor. • PLAY PAUSE mode.	TP3/SV-57 PAUSE mode. T = 0 ± 0.1 μsec	⊘ RV10/SV-57 TRIG; TP3/SV-57

10-12. DRUM AFC TRANSIENT ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• PLAY*PAUSE mode • Connect between TP7 and TP18/SV-57 by 100Ω resistor. • Short TP6—E1/SY-22.	TP11/SV-57 DC level in PAUSE mode = REF	
• Disconnect the shorting clip between TP7 and TP18/SV-57. • PLAY mode.	TP11/SV-57 DC level in PLAY mode = (REF) ± 0.05 V	⊘ RV9/SV-57

SECTION 11
AUDIO SYSTEM ALIGNMENT

[Equipment Required]

- Dual Trace Oscilloscope.
- Frequency Counter.
- Blank Tape; KCS-20 and KSP-S20 (SONY standard product)
- Audio Oscillator
- VTVM
- Alignment Tape;

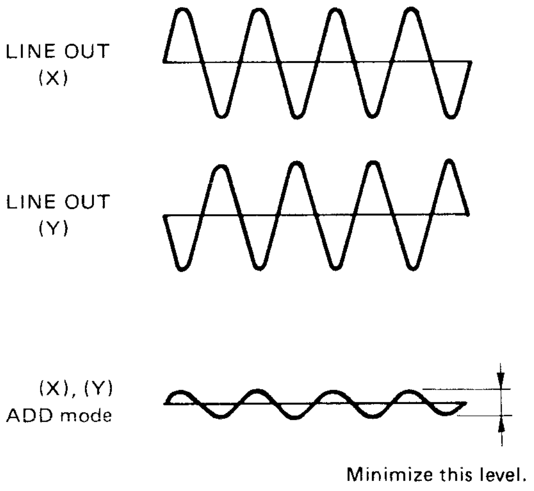
  RR5-1SD PAL (Parts No. 8-960-036-80) – SP tape –

Time (min.)	Video	Audio	Time code
5	Color bars	–	–
3	Gated sweep (B/W)	1 kHz, 0 dB	–
3	Gated sweep (color)	10 kHz, –10 dB	–
3	Pulse & bar (MOD 10T and inverted 2T)	1 kHz, –20 dB (NR: OFF) 40 Hz, –20 dB (NR: OFF) 7 kHz, –20 dB (NR: OFF) 10 kHz, –20 dB (NR: OFF) 15 kHz, –20 dB (NR: OFF)	–
3	Monoscope (color)	1 kHz, –20 dB (NR: ON) 15 kHz, –20 dB (NR: ON)	–
3	Pseudo color bars	–	EBU Time code

11-1. AUDIO OUTPUT FREQUENCY RESPONSE ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• Playing back the audio 40Hz, 1kHz, 3kHz, 7kHz, 10kHz and 15kHz segment of SP alignment tape. • Set the LV103, LV203/AU-49 to its mechanical center. • Dolby SW; OFF	LINE OUT connector (terminated by 600 ohm) 1 kHz Level = Ref. Level 40 Hz Level = (Ref. Level) $-3\,\text{dB}^{+5}_{-2}$ dB 3 kHz, 7 kHz, 10 kHz and 15 kHz Level = (Ref. Level) ±0.5 dB	3 kHz to 7 kHz adj. ⊘ RV102/AU-49A (CH-1) ⊘ RV202/AU-49A (CH-2) 10 kHz to 15 kHz adj. ⊘ RV103/AU-49A (CH-1) ⊘ RV203/AU-49A (CH-2)

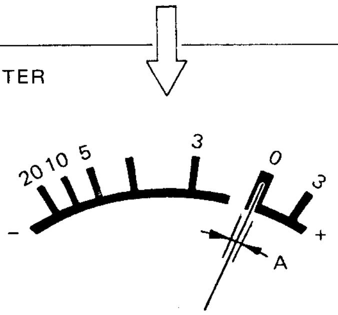
11-2. AUDIO OUTPUT BALANCE ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• LINE IN connector; 1kHz, +4dB • EE mode. • Oscilloscope → ADD mode. • AUDIO LEVEL Selector; MANUAL	TP102/AU-64 (CH-1) TP202/AU-65 (CH-2) −10 dB ± 0.5 dB	⊘ AUDIO LEVEL VR CH-1/CH-2 (Front panel)
	 LINE OUT (X) LINE OUT (Y) (X), (Y) ADD mode Minimize this level.	⊘ RV108/AU-49A (CH-1) ⊘ RV208/AU-49A (CH-2)

11-3. PB OUTPUT LEVEL ADJUSTMENT

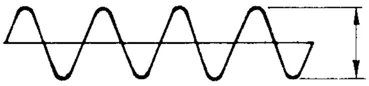
machine conditions for adjustment	spec.	adjustment
• LINE IN connector; 1kHz, +4dB • EE mode. • AUDIO LEVEL Selector; MANUAL	TP102/AU-64 (CH-1) TP202/AU-65 (CH-2) −10 dB ± 0.5 dB	⊘ AUDIO LEVEL VR CH-1/CH-2 (Front panel)
• Playing back the audio 1kHz segment of Alignment tape.	TP102/AU-64 (CH-1) TP202/AU-65 (CH-2) −10 dBm ± 0.5 dB	⊘ RV104/AU-49A (CH-1) ⊘ RV204/AU-49A (CH-2)
• Playing back the audio 1kHz segment of Alignment tape.	LINE OUT connector (Terminated by 600 ohm) +4.0 dBm ± 0.5 dBm	⊘ RV101/AU-64 (CH-1) ⊘ RV201/AU-65 (CH-2)

11-4. AUDIO LEVEL CONTROL SETTING/METER ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• MIC IN connector; 1kHz, −60 dB • EE mode. • METER SELECT sw; CH-1	LINE OUT connector (terminated by 600 ohm) +4.0 dB ± 0.2 dB	⊘ AUDIO LEVEL VR CH-1/CH-2 (Front panel)
	AUDIO METER  Pointer stays in center of A.	⊘ RV302/AU-49A (CH-1) ⊘ RV303/AU-49A (CH-2)

NOTE: The AUDIO LEVEL control should not be touch until rest of Sec. 10 Audio System Alignment are completed.

11-5. SAME PHASE ELIMINATE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• LINE IN connector; 1kHz, +4dB (same phase) • MIC/LINE SELECT sw; LINE • EE mode	TP1/CM-19A, CH-1 TP51/CM-19A, CH-2  Minimize this level.	⊘ RV1/CM-19A (CH-1) ⊘ RV51/CM-19A (CH-2)

11-6. LIMITER LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• MIC IN connector; 1kHz, −30dB • EE mode.	LINE OUT connector (terminated by 600 ohm) +12 dBm ±0.5 dBm	⊘ RV105/AU-49A (CH-1) ⊘ RV205/AU-49A (CH-2)

11-7. ERASE OSCILLATOR FREQUENCY ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; Video signal • REC mode using KSP cassette.	TP301/AU-51A 71 kHz ± 2 kHz	⊘ SL1~3/AU-51A

11-8. DUB ERASE OSCILLATOR FREQUENCY ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• DUB mode using KSP cassette.	TP303/AU-51A 71 kHz ± 3 kHz	⊘ LV301/AU-51A

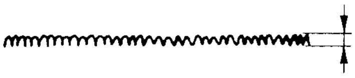
11-9. REC FREQUENCY RESPONSE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; Video signal • Short TP301−E301/AU-51A. • MIC IN connector; 1kHz, −70dB/10kHz, −70dB/15kHz, −70dB/18kHz, −70dB • REC mode.	TP102/AU-49A (CH-1) TP202/AU-49A (CH-2) 1 kHz, −70 dB = Ref. Level 10 kHz, −70 dB = (Ref. Level) + 6.0 dB ± 2.0 dB 15 kHz, −70 dB = (Ref. Level) + 13.0 dB ± 3.0 dB 18 kHz, −70 dB = Less than 16.0 dB	⊘ LV102, RV107/AU-49A (CH-1) ⊘ LV204, RV207/AU-49A (CH-2)

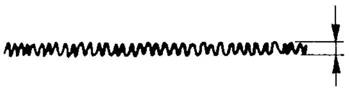
11-10. BIAS CURRENT ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• MIC IN connector; 1kHz, −60dB • VIDEO IN; Video signal • REC mode using KSP cassette. • Temporarily set the LV202, RV201/AU-49A to fully CW.	TP102/AU-49A (CH-1) TP202/AU-49A (CH-2) 10.0mV ± 0.5mV	⊘ RV101/AU-51A (CH-1) ⊘ RV201/AU-51A (CH-2)
• MIC IN connector; 1kHz, −60dB • VIDEO IN; Video signal • REC mode using KCS cassette.	TP102/AU-49A (CH-1) TP202/AU-49A (CH-2) 8.0mV ± 0.5mV	⊘ RV301/AU-51A

11-11. BIAS TRAP ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• Short TP6 – E1/SY-22. • VIDEO IN; Video signal • LINE IN; No signal. • REC mode.	TP101/AU-49A (CH-1) TP201/AU-49A (CH-2)  Minimize the BIAS leak.	⊘ LV101/AU-49A (CH-1) ⊘ LV201/AU-49A (CH-2)

11-12. DUB BIAS TRAP ADJUSTMENT

machine conditions for adjustment	**spec.**	**adjustment**
• Short TP6–E1/SY-22. • VIDEO IN; Video signal • Input connector; No signal. • DUB mode.	TP203/AU-49A  Minimize the BIAS leak. (Max −10dB)	⊘ LV202/AU-49A

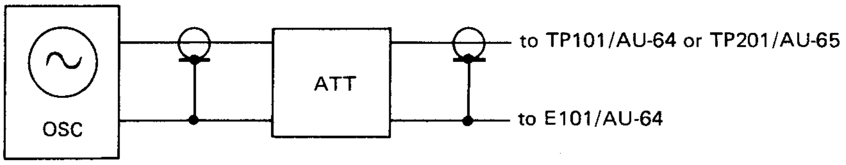
11-13. AUDIO REC LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; Video signal • MIC IN connector; 1 kHz, –60 dB • REC mode and PB mode using KSP cassette.	LINE OUT connector (terminated by 600 ohm) The self record/playback level should be +4.0 dB ±0.3 dB. (The level difference between CH-1 and CH-2 should be less than 0.5 dB)	⊘ RV106/AU-49A (CH-1) ⊘ RV206/AU-49A (CH-2)

11-14. CROSS-TALK CANCEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; Video signal • Short TP6—E1/SY-22. • CH-1 MIC IN connector; 5 kHz, –60 dB • DUB mode. (No signal have to be recorded in CH-2.)	TP203/AU-49A Minimize the output level.	⊘ RV201/AU-49A

11-15. SPECTRAL SKEWING ADJUSTMENT



1 kHz, 17 kHz

Adjustment 1 kHz (–10 dB ± 0.1 dB) at TP102/AU-64 and TP202/AU-64 by AUDIO LEVEL VR and ATT.

machine conditions for adjustment	spec.	adjustment
• Connect the OSC and ATT. • EE mode.	TP102/AU-64; CH-1 TP202/AU-65; CH-2 1 kHz = –10 dB ± 0.1 dB (REF) 17 kHz = –18.3 dB ± 0.1 dB	⊘ LV101/AU-64 (CH-1) ⊘ LV201/AU-65 (CH-2)

SECTION 12
VIDEO SYSTEM ALIGNMENT

[Equipment Required]
- Dual Trace Oscilloscope
- Frequency Counter
- Signal Generator
- Spectrum Analyzer
- Vectorscope
- Current Probe
- Blank Tapes; KCS-20 and KSP-S20 (SONY standard products)
- Alignment Tapes

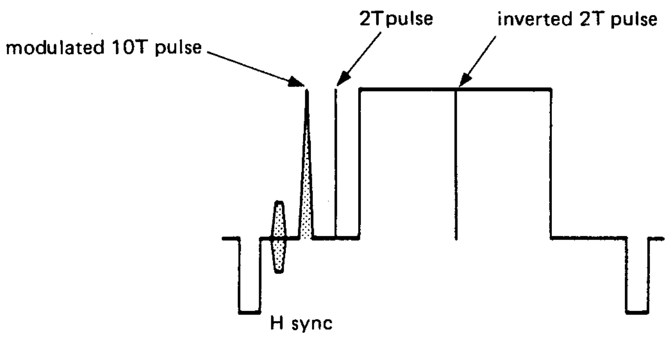
RR5-1SD PAL (Parts No. 8-960-036-80) – SP tape –

Time (min.)	Video	Audio	Time code
5	Color bars	–	–
3	Gated sweep (B/W)	1 kHz, 0 dB	–
3	Gated sweep (color)	10 kHz, –10 dB	–
3	Pulse & bar (MOD 10T and inverted 2T)	1 kHz, –20 dB (NR: OFF) 40 Hz, –20 dB (NR: OFF) 7 kHz, –20 dB (NR: OFF) 10 kHz, –20 dB (NR: OFF) 15 kHz, –20 dB (NR: OFF)	–
3	Monoscope (color)	1 kHz, –20 dB (NR: ON) 15 kHz, –20 dB (NR: ON)	–
3	Pseudo color bars	–	EBU Time code

RR5-2SB PAL (Part No. 8-960-020-62) – Conventional tape –

Time (min.)	Video	Audio	Time code
5	Color bars	3 kHz, 0 dB	1 kHz
5	R-F sweep	–	–
5	Monoscope	–	–
2.5	Modulated 20T pulse	1 kHz, 0 dB	–
2.5	R-F 8 MHz	10 kHz, –10 dB	–

[Video Signals Required]
- Color Bar Signal; 75% color bar signal
- Sin^2 wave signal;

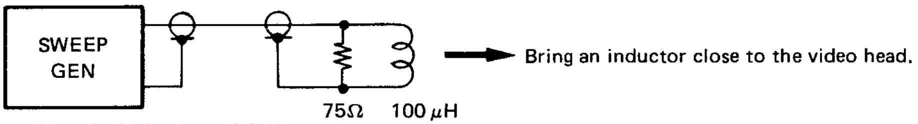


- Gated Sweep Signal; (1 MHz to 10 MHz)
- 100% full field signal
- Linearity 5 steps signal

12-1. VIDEO PLAYBACK SYSTEM ALIGNMENT

12-1-1. PB RF Frequency Response Adjustment

To make this adjustment, stop the rotation of the head drum without cassette tape and to L-couple sweep signal with the video head using an inductor (approx. 100 μH).



Sweep signal band width; 1 to 10 MHz

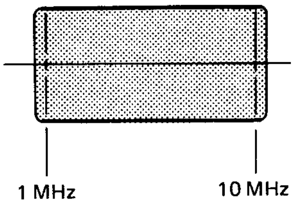
Step 1. CH-A PB amp adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>spec.</th><th>adjustment</th></tr>
<tr><td>

- Short TP16—E2/PSB-4.
- Short TP17—E1/PSB-4.
- Temporarily set RV201/VO-12 to fully CW.
- POWER ON.
- Couple the sweep signal with CH-A video head.
- Adjust coupling so that 1 MHz level is approximately 50 mVpp at TP1/RP-24.

</td><td>

TP1/RP-24



<table><tr><td>1 MHz</td><td>10 MHz</td></tr><tr><td>100%
(REF)</td><td>100%
±2%</td></tr></table>

</td><td>

⊘ RV5/RP-24

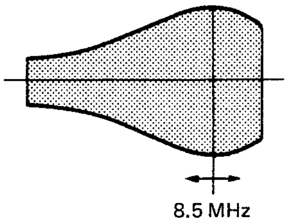
TRIG; TRIG OUT of SWEEP GEN

</td></tr>
<tr><td rowspan="2">

- Temporarily set RV201/VO-12 to its mechanical center.
- Short TP107—E1/VO-12.
- Temporarily set RV203/VO-12 to fully CCW.

</td><td>

TP204/VO-12



waveform peak = 8.5 MHz

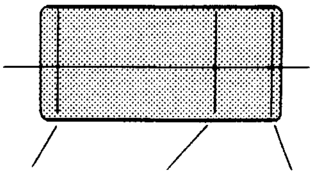
</td><td>

⊘ LV201/VO-12

TRIG; TRIG OUT of SWEEP GEN

</td></tr>
<tr><td>

TP204/VO-12



<table><tr><td>1 MHz</td><td>7 MHz</td><td>10 MHz</td></tr><tr><td>100%
(REF)</td><td>110% $^{+5}_{-10}$ %</td><td>100%
±5%</td></tr></table>

</td><td>

⊘ RV203/VO-12

TRIG; TRIG OUT of SWEEP GEN

</td></tr>
</table>

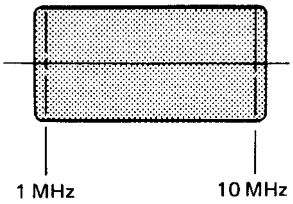
Step 2. CH-B PB amp adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>spec.</th><th>adjustment</th></tr>
<tr><td>

- Short TP16–E2/PSB-4.
- Short TP17–E1/PSB-4.
- Temporarily set RV202/VO-12 to fully CCW.
- POWER ON.
- Couple the sweep signal with CH-B video head.
- Adjust coupling so that 1 MHz level is approximately 50 mVpp at TP2/RP-24.

</td><td>

TP2/RP-24



<table><tr><th>1 MHz</th><th>10 MHz</th></tr><tr><td>100%
(REF)</td><td>100%
±2%</td></tr></table>

</td><td>

⊘ RV7/RP-24

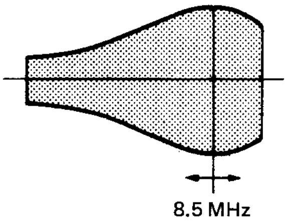
TRIG; TRIG OUT of SWEEP GEN

</td></tr>
<tr><td rowspan="2">

- Temporarily set RV202/VO-12 to its mechanical center.
- Short TP107–TP108/VO-12.
- Temporarily set RV204/VO-12 to fully CCW.

</td><td>

TP204/VO-12



waveform peak = 8.5 MHz

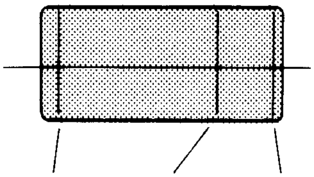
</td><td>

⊘ LV202/VO-12

TRIG; TRIG OUT of SWEEP GEN

</td></tr>
<tr><td>

TP204/VO-12



<table><tr><th>1 MHz</th><th>7 MHz</th><th>10 MHz</th></tr><tr><td>100%
(REF)</td><td>110%
$^{+5}_{-10}$%</td><td>100%
±5%</td></tr></table>

</td><td>

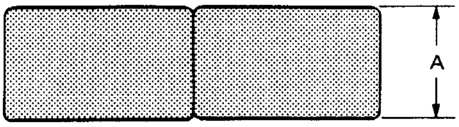
⊘ RV204/VO-12

TRIG; TRIG OUT of SWEEP GEN

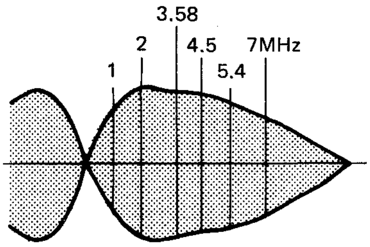
</td></tr>
</table>

Step 3. RF level adjustment

Before this adjustment, adjustments in section 12-4-1 to 12-4-7 and section 12-3-1 to 12-3-7 have to be adjusted.

machine conditions for adjustment	**spec.**	**adjustment**
• VIDEO IN: Color bar signal. • Play back the self-recorded portion using KSP cassette.	RF (OFF TAPE) connector (75 ohm terminated)  A = 0.5 V ± 0.1 V (sync tip level)	CH-A adj. ⊘ RV201/VO-12 CH-B adj. ⊘ RV202/VO-12 TRIG; TP210/VO-12

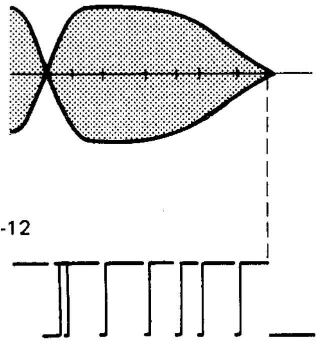
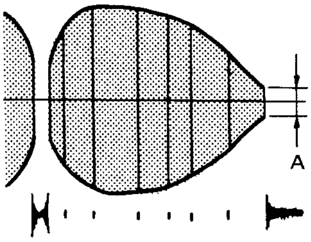
Step 4. PB amp frequency response check

<table>
<tr><th>machine conditions for adjustment</th><th>spec.</th><th>adjustment</th></tr>
<tr><td>• Short TP3–E2/SV-57C.
• Play back the RF SWEEP segment of conventional Alignment tape.</td><td>TP204/VO-12

<table>
<tr><td>2 MHz</td><td>3.58 MHz</td><td>4.5 MHz</td><td>5.4 MHz</td><td>7 MHz</td></tr>
<tr><td>100%
(REF)</td><td>80%
±10%</td><td>70%
±10%</td><td>45%
±10%</td><td>35%
±5%</td></tr>
</table></td><td>TRIG; TP210/VO-12</td></tr>
</table>

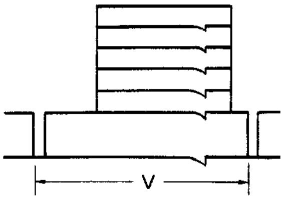
12-1-2. DOC DC Bias Adjustment

machine conditions for adjustment	spec.	adjustment
• PLAY mode.	TP407/VO-12 6.5 V ± 0.1 Vdc	⊘ RV402/VO-12

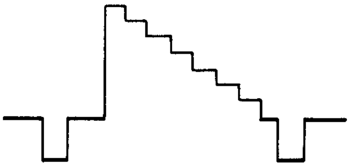
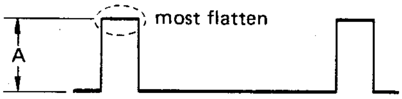
12-1-3. Dropout Compensator Sensitivity Adjustment

machine conditions for adjustment	spec.	adjustment
• Short TP3–E2/SV-57. • Play back the RF SWEEP segment of conventional Alignment tape. • Oscilloscope: CHOP mode and ADD mode. • Short TP209–E301/VO-12.	TP212/VO-12  Oscilloscope: ADD mode  A = 43 mV ± mV	⊘ RV401/VO-12 TRIG; TP210/VO-12

12-1-4. DOC Level Adjustment

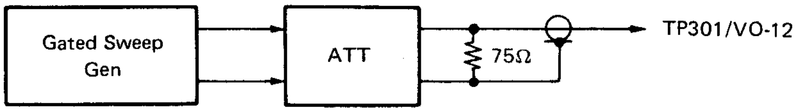
machine conditions for adjustment	spec.	adjustment
• Play back the pseudo color bar segment of SP Alignment tape. • Short TP209–E301/VO-12.	TP301/VO-12  Equalize dropout compensated white level and original white level.	⊘ RV305/VO-12 TRIG; TP210/VO-12

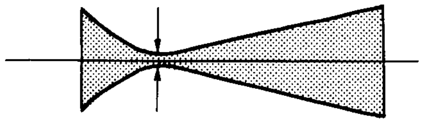
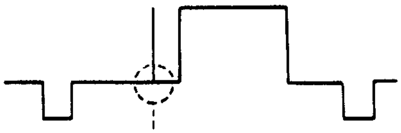
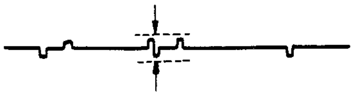
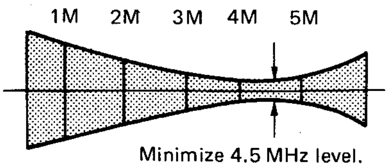
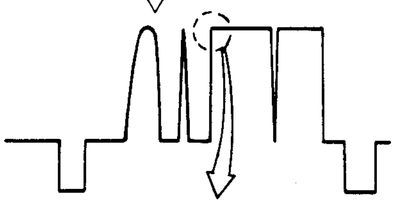
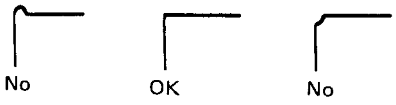
12-1-5. SP Mode Detector Adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of conventional Alignment tape. • Oscilloscope: CHOP mode.	TP301/VO-12  TP205/VO-12  Maximize A Level (A ≧ 1.5 V)	⊘ LV203/VO-12 TRIG; TP301/VO-12

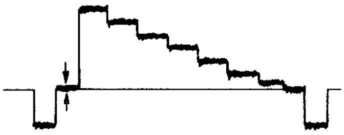
NOTE: After this adjustment, confirm that D201 on VO-12 board lights up when the color bar segment of SP alignment tape is played back.

12-1-6. Noise Canceller Adjustment

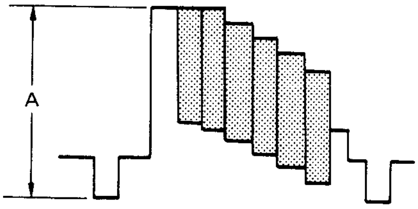


machine conditions for adjustment	spec.	adjustment
• Unsolder SL301/VO-12. • Short TP17–E1/PSB-4. • Short TP16–E2/PSB-4. • Supply a sweep signal (20 mVpp) to TP301/VO-12. • Temporarily set RV2/VA-29 to fully CW.	TP4/VA-29  Minimize 2 MHz level.	⊘ RV1/VA-29 TRIG; TRIG OUT of SWEEP GEN
• Short TP2–TP3/VA-29. • Supply a pulse & bar signal to TP301/VO-12. • Oscilloscope: ALT mode.	TP4/VA-29  TP1/VA-29  Minimize this level.	⊘ RV3/VA-29 TRIG; TP52/VO-12
• Supply a gated sweep signal (20 mVpp) to TP301/VO-12.	TP52/VO-12  Minimize 4.5 MHz level.	⊘ RV4/VA-29 TRIG; TRIG OUT of SWEEP GEN
• Disconnect the shorting clips between TP2–TP3/VA-29, TP17–E1/PSB-4 and TP16–E2/PSB-4. • Solder SL301/VO-12. • VIDEO IN: Pulse & bar signal. • Play back the self-recorded portion using KSP cassette.	TP52/VO-12  	⊘ RV2/VA-29 TRIG; INT

12-1-7. Carrier Balance Adjustment

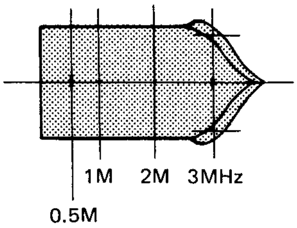
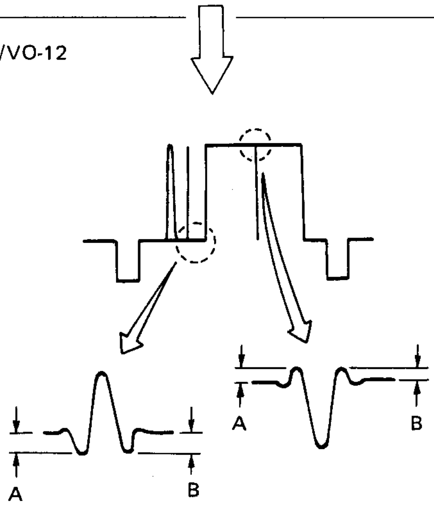
machine conditions for adjustment	**spec.**	**adjustment**
• Play back the color bar segment of SP Alignment tape.	TP301/VO-12  Minimize the noise level at pedestal portion.	⊘ RV205/VO-12 TRIG; INT

12-1-8. Y Output Level Adjustment (SP mode and conventional mode)

machine conditions for adjustment	**spec.**	**adjustment**
SP mode adj. • Play back the color bar segment of SP Alignment tape. Conventional mode adj. • Play back the color bar segment of conventional Alignment tape.	VIDEO OUT connector (75 ohm terminated)  A = 1.0 V ± 0.05 V	SP mode adj. ⊘ RV301/VO-12 Conventional mode adj. ⊘ RV307/VO-12 TRIG; INT

12-1-9. PB Y Frequency Response & Phase Equalizer Adjustment

Step 1. SP mode adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>spec.</th><th>adjustment</th></tr>
<tr>
<td>• Short TP404–E401/VO-12.
• Play back the gated sweep (color) segment of SP Alignment tape.</td>
<td>TP52/VO-12

<table>
<tr><td>0.5 MHz</td><td>1 MHz</td><td>2 MHz</td><td>3 MHz</td></tr>
<tr><td>100%
(REF)</td><td>100%
±5%</td><td>100%
±10%</td><td>90%
±5%</td></tr>
</table>
</td>
<td>⊘ CV302/VO-12
TRIG; TP210/VO-12</td>
</tr>
<tr>
<td>• Short TP404–E401/VO-12.
• Play back the pulse & bar segment of SP Alignment tape.</td>
<td>TP52/VO-12

Equalize A level and B level.</td>
<td>⊘ RV304/VO-12
TRIG; INT</td>
</tr>
</table>

NOTE: After these adjustments in step 1, adjust the step 2 conventional mode adjustment.

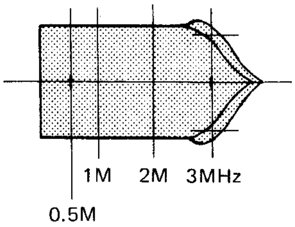
Step 2. Conventional mode adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>spec.</th><th>adjustment</th></tr>
<tr><td>

- Shot TP404—E401/VO-12.
- VIDEO IN: Gated sweep signal.
- Play back the self-recorded portion using KCS cassette.

</td><td>

TP52/VO-12



<table>
<tr><th>0.5 MHz</th><th>1 MHz</th><th>2 MHz</th><th>3 MHz</th></tr>
<tr><td>100%
(REF)</td><td>100%
±10%</td><td>100%
±10%</td><td>95%
±15%</td></tr>
</table>

</td><td>

⊘ CV301/VO-12

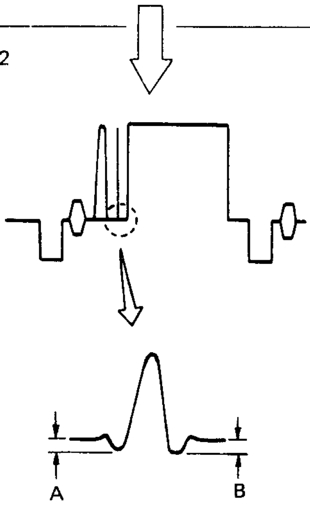
TRIG; TP210/VO-12

</td></tr>
<tr><td>

- Short TP404—E401/VO-12.
- Play back the MOD 20T pulse segment of conventional Alignment tape.

</td><td>

TP52/VO-12



Equalize A level and B level.

</td><td>

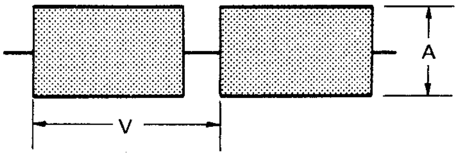
⊘ RV306/VO-12

TRIG; INT

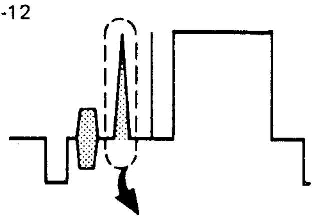
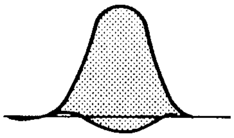
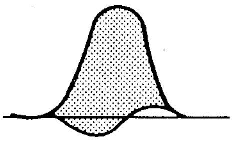
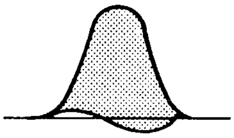
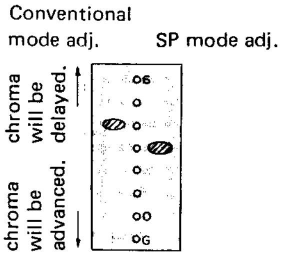
</td></tr>
</table>

12-2. CHROMA PLAYBACK SYSTEM ALIGNMENT

12-2-1. PB Chroma RF Level Adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of SP Alignment tape. • TRACKING VR: Center detent.	TP13/CR-26  A = 0.17 V ± 0.01 V	CH-A adj. ⊘ RV206/VO-12 CH-B adj. ⊘ RV207/VO-12 TRIG; TP210/VO-12

12-2-2. PB Y/C Delay Adjustment

machine conditions for adjustment	spec. & adjustment
SP mode adj. - Play back the MOD. 10T pulse segment of SP Alignment tape. Conventional mode adj. - Play back the MOD. 20T pulse segment of conventional Alignment tape.	TP52/VO-12   ① Y and Chroma signals are in phase.  ② Chroma signal is advanced.  ③ Chroma signal is delayed. TRIG; INT - SP and conventional mode adj. ⊘ DL401/VO-12 - Select the suitable tap according to short any taps of DL401/VO-12 board so that the waveform meets the fig. ① . - Each one tap is 0.05 μsec delayed. - The fig ③ shows that the chroma signal is delayed from the fig ① .  Conventional mode adj. SP mode adj. chroma will be delayed. chroma will be advanced. S G DL401/VO-12 (Soldering Side)

12-2-3. PB REF OSC Adjustment

machine conditions for adjustment	spec.	adjustment
S/N: Up to 10190 • Temporarily set RV13/CR-26 to fully CCW. • Play back the color bar segment of SP Alignment tape.	TP5/CR-26 4,433,619 Hz ± 5 Hz	⊘ T1/CR-26
S/N: 10191 and higher • VIDEO IN: No signal. • REC mode.	TP5/CR-26 4,433,619 Hz ± 5 Hz	

NOTE: Only serial No. up to 10190, after this adjustment, adjust section 12-2-5 REC REF OSC Adjustment.

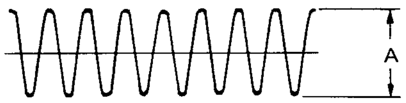
12-2-4. APC VCO Adjustment

machine conditions for adjustment	spec.	adjustment
• Temporarily set RV1/CR-26 to fully CW. • Play back the color bar segment of SP Alignment tape.	TP3/CR-26 7.5 V ± 0.1 Vdc	⊘ RV1/CR-26

12-2-5. REC REF OSC Adjustment

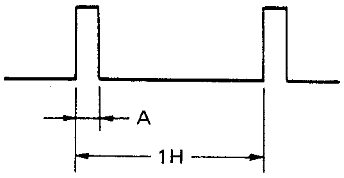
machine conditions for adjustment	spec.	adjustment
S/N: Up to 10190 • Fit a safety red-cap with the SP Alignment Cassette. • VIDEO IN: No signal. • Push the REC button during playing back the color bar segment of SP Alignment tape.	TP5/CR-26 REF OSC Frequency in PB mode = REF OSC Frequency in EE mode ± 10 Hz	⊘ RV13/CR-26
S/N: 10191 and higher • Play back the color bar segment of SP Alignment tape.	TP5/CR-26 4,433,619 Hz ± 10 Hz	

12-2-6. 5.35 MHz Level Adjustment

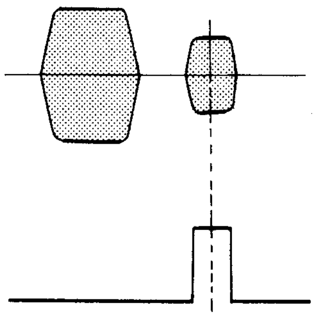
machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of SP Alignment tape.	TP7/CR-26  A = 0.5 V ± 0.05 V	⊘ RV2/CR-26 TRIG; INT

12-2-7. PB ACC Burst Gate Adjustment

Step 1. Burst flag width adjustment

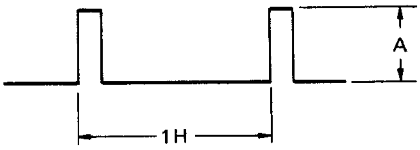
machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of SP Alignment tape.	TP6/CR-26  A = 2.5 μs ± 0.1 μs	⊘ RV4/CR-26 TRIG; TP1/CR-26

Step 2. Burst flag phase adjustment

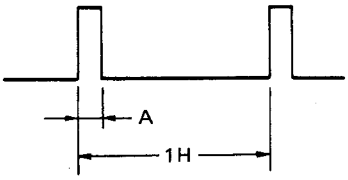
machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of SP Alignment tape. • Oscilloscope ALT mode.	TP10/CR-26 TP6/CF-26  Adjust the center of both waves.	⊘ RV5/CR-26 TRIG; TP1/CR-26

12-2-8. PB APC Burst Gate Adjustment

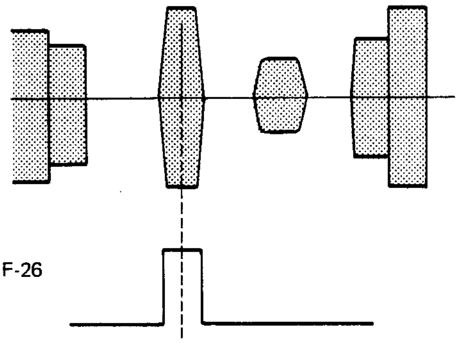
Step 1. Burst flag level adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of SP Alignment tape.	TP4/CR-26  A = 3.6 V ± 0.1 V	⊘ RV3/CR-26 TRIG; TP1/CR-26

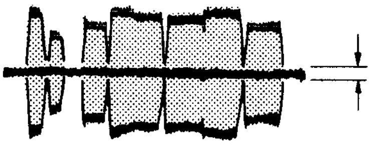
Step 2. Burst flag width adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of SP Alignment tape.	TP4/CR-26  A = 2.5 μs ± 0.1 μs	⊘ RV7/CR-26 TRIG; TP1/CR-26

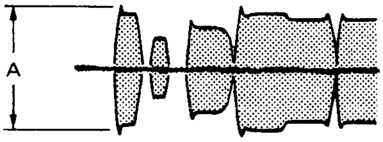
Step 3. Burst flag phase adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the color bar segment of SP Alignment tape. • Oscilloscope: CHOP mode.	TP10/CR-26  TP6/CF-26 Adjust the center of both waves.	⊘ RV8/CR-26 TRIG; TP1/CR-26

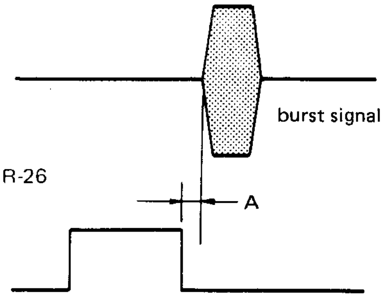
12-2-9. Converter Balance Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
- Play back the color bar segment of SP Alignment tape.	TP10/CR-26  Minimize the carrier leak.	⊘ RV12/CR-26 TRIG; TP1/CR-26

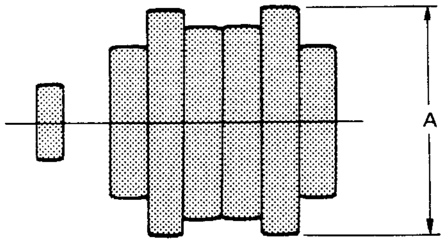
12-2-10. PB ACC Level Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
- Play back the color bar segment of SP Alignment tape.	TP10/CR-26  A = 0.5 V ± 0.05 V	⊘ RV9/CR-26 TRIG; TP1/CR-26

12-2-11. Pilot Burst Gate Width Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
- Play back the color bar segment of SP Alignment tape.	TP502/VO-12 TP11/CR-26  A = 0	⊘ RV6/CR-26 TRIG; TP1/CR-26

12-2-12. Chroma Level Adjustment /OUTPUT

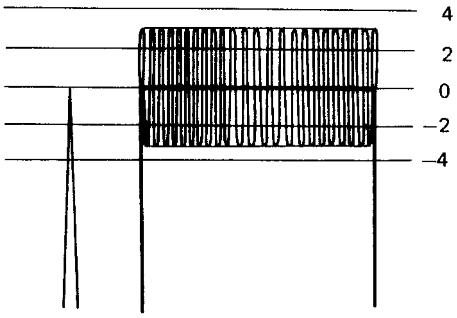
machine conditions for adjustment	spec.	adjustment
• Temporarily set RV504/VO-12 to fully CW. • Temporarily set RV501/VO-12 to fully CCW. • Play back the color bar segment of SP Alignment tape.	TP502/VO-12  A = 0.5 V ± 0.05 V	⊘ RV501/VO-12 TRIG; TP1/CR-26

After this adjustment, adjust section 12-2-14 DG Compensator adjustment.

12-2-13. High Speed ACC Adjustment

machine conditions for adjustment	spec.	adjustment
• Any mode.	Set to fully CW.	⊘ RV503/VO-12

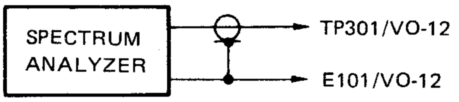
12-2-14. DG Compensator Adjustment

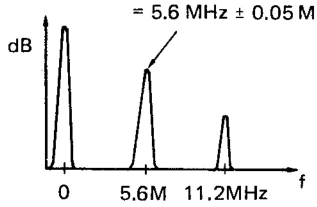
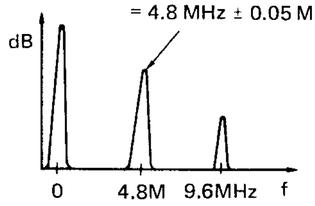
machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Linearity 5 steps signal. • Play back the self-recorded portion using KSP cassette. • Temporarily set RV504/VO-12 to fully CCW.	VIDEO OUT connector (75 ohm terminated) Vectorscope (DG mode)  DG = 0 ± 4%	⊘ RV504/VO-12

12-3. VIDEO RECORDING SYSTEM ALIGNMENT

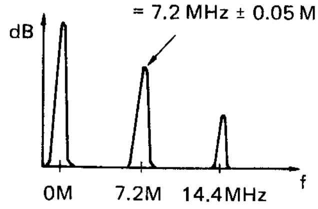
12-3-1. Sync Tip Carrier Frequency Adjustment

[Connection]

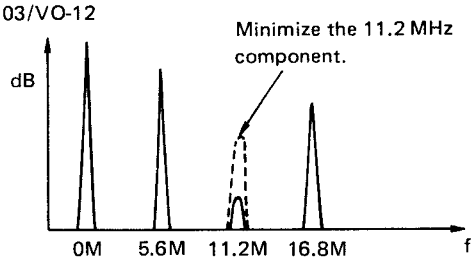


machine conditions for adjustment	spec.	adjustment
• VIDEO IN: No signal. • Put the machine into EE mode using KCS cassette. • Short TP209–TP211/VO-12. • Observe the carrier frequency at TP103 on VO-12 board using a spectrum analyzer.	TP103/VO-12 sync tip carrier frequency = 5.6 MHz ± 0.05 MHz 	SP mode adj. ⊘ RV104/VO-12
• Disconnect the shorting clip between TP209 and TP211/VO-12. • Short TP209–E301/VO-12.	TP103/VO-12 sync tip carrier frequency = 4.8 MHz ± 0.05 MHz 	Conventional mode adj. ⊘ RV105/VO-12

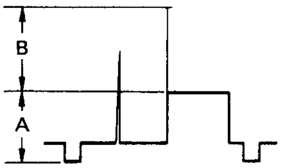
12-3-2. FM Deviation Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: 100% full field signal. • Short TP209–TP211/VO-12. • EE mode. • Observe the carrier frequency at TP103 on VO-12 board using a spectrum analyzer.	TP103/VO-12 white peak carrier frequency = 7.2 MHz ± 0.05 MHz 	⊘ RV101/VO-12 TRIG; INT

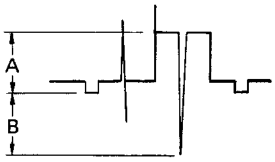
12-3-3. REC HF Balance Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: No signal. • Short TP209–TP211/VO-12. • EE mode. • Observe the carrier frequency at TP8 on RP-24 board using a spectrum analyzer.	TP103/VO-12  Minimize the 11.2 MHz component. 	⊘ RV102/VO-12

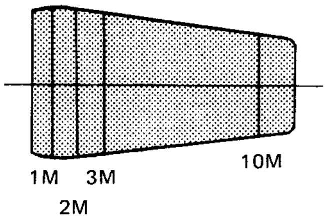
12-3-4. White Clip Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Pulse & bar signal. • Put the machine into EE mode using KCS cassette. • Short TP209–TP211/VO-12.	TP104/VO-12  $\frac{B}{A} = \frac{130\% \pm 5\%}{100\%}$	SP mode adj. ⊘ RV106/VO-12
• Disconnect the shorting clip between TP209–TP211/VO-12. • Short TP209–E301/VO-12.	$\frac{B}{A} = \frac{120\% \pm 5\%}{100\%}$	Conventional mode adj. ⊘ RV107/VO-12

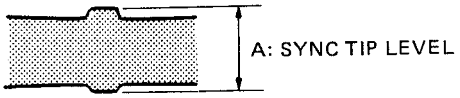
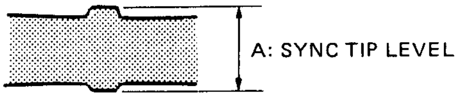
12-3-5. Dark Clip Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Pulse & bar signal. • Put the machine into EE mode using KCS cassette. • Short TP209–TP211/VO-12.	TP104/VO-12  $\frac{B}{A} = \frac{120\% \pm 5\%}{100\%}$	SP mode adj. ⊘ RV108/VO-12
• Disconnect the shorting clip between TP209–TP211/VO-12. • Short TP209–E301/VO-12.	$\frac{B}{A} = \frac{100\% \pm 5\%}{100\%}$	Conventional mode adj. ⊘ RV109/VO-12

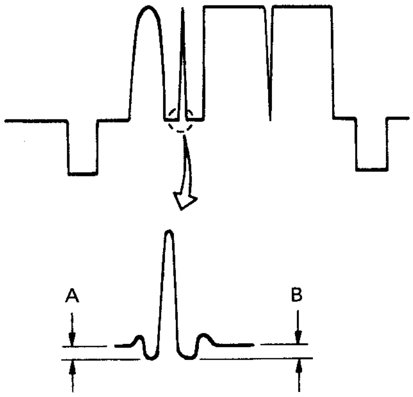
12-3-6. Y REC Current Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>spec.</th><th>adjustment</th></tr>
<tr>
<td>• VIDEO IN: Color bar signal.
• Disconnect the shorting plugs CP1 and CP2 on the RP-24 board.
• Temporarily set RV2/RP-24 to fully CCW.
• Short TP7–E/RP-24.
• Short TP3–TP4/RP-24.
• Short TP5–TP6/RP-24.
• Connect the sweep signal to TP8/RP-24.
• Put the machine into REC mode using KCS cassette.</td>
<td>CH-A; TP3–TP4/RP-24
CH-B; TP5–TP6/RP-24
Current waveform observed using a current probe

<table>
<tr><td>1 MHz</td><td>10 MHz</td></tr>
<tr><td>100%
(REF)</td><td>80%
±5%</td></tr>
</table>
</td>
<td>CH-A adj.
⊘ RV3/RP-24
CH-B adj.
⊘ RV4/RP-24
TRIG; TRIG OUT of SWEEP GEN</td>
</tr>
</table>

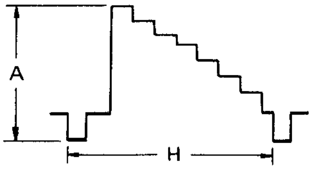
12-3-7. Y REC Current Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • Temporarily set RV2/RP-24 to fully CCW. • Short TP209—TP211/VO-12. • Disconnect the shorting plugs CP1 on the RP-24 board. • Put the machine into REC mode using KCS cassette.	TP3—TP4/RP-24 Current waveform observed using a current probe  A = 55 ± 5mA	SP mode adj. ⊘ RV1/RP-24 TRIG; TP210/VO-12
• Disconnect the shorting clip between TP209—TP211/VO-12. • Short TP209—E301/VO-12. • Put the machine into REC mode using KCS cassette.	TP3—TP4/RP-24 Current waveform observed using a current probe  A = 67 ± 5mA	Conventional mode adj. ⊘ RV103/VO-12 TRIG; TP210/VO-12

12-3-8. REC Y Phase Equalizer Adjustment

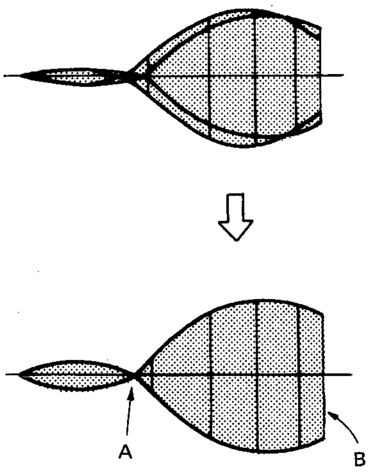
machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Pulse & bar signal. • Play back the self-recorded portion using KSP cassette.	TP52/VO-12  A = B	⊘ RV1/YC-20 TRIG; INT

12-3-9. CONFI Y Level Adjustment

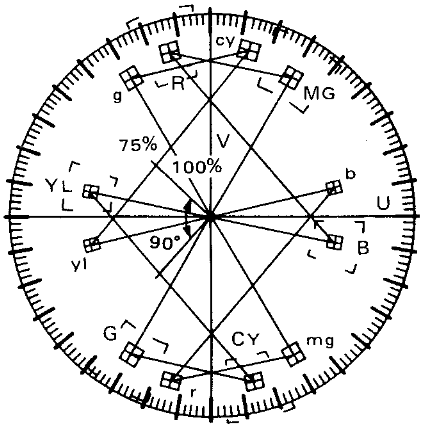
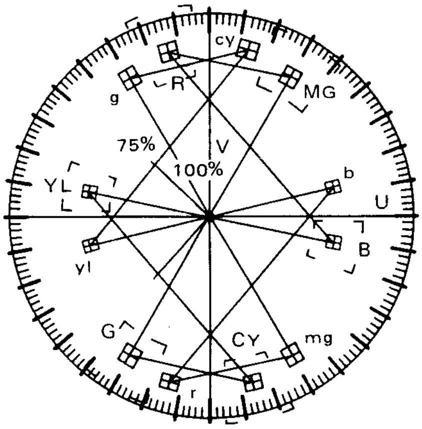
machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • Put the machine into REC mode using KSP cassette.	TP53/VO-12  A = 2.0 V ± 0.1 V	⊘ RV1/BF-12 TRIG; INT

12-4. CHROMA MODULATOR ALIGNMENT

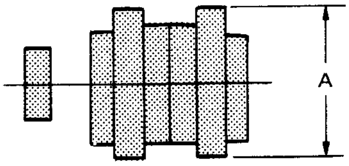
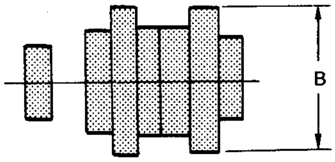
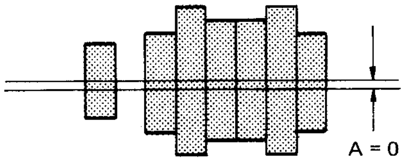
12-4-1. Correlator Bias Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Gated sweep signal. • EE mode. • Oscilloscope: CHOP mode. (CH-2: Invert mode)	TP201/YC-20: CH-1 and CH-2  Equalize the waveform at point A and B.	⊘ RV101/YC-20 TRIG; TRIG OUT of SWEEP GEN

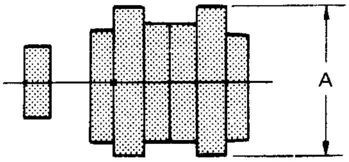
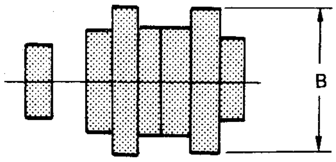
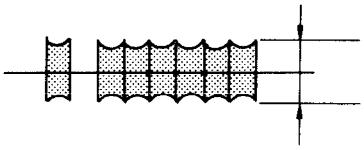
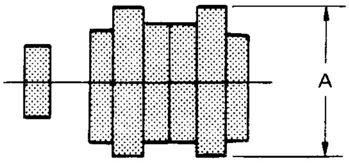
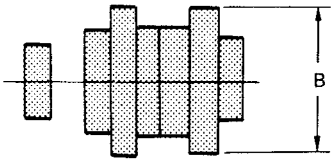
12-4-2. Slice Level Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • EE mode.	Step 1. TP204/YC-20; Lower side adj. TP205/YC-20; Upper side adj.  cy R g MG 75% V 100% b YL U B 90° yl G CY mg r All spots (except burst signal) are within the specified scale point on the vectorscope screen.	⊘ Phase control volume and gain control volume on the vectorscope
	Step 2. TP204/YC-20; Lower side adj. TP205/YC-20; Upper side adj.  cy R g MG 75% V 100% b YL U B yl G CY mg r Adjust RV201/202 so that two burst spots are within the specified scale point. Adjust step 1 and step 2 repeatedly so that all spots are within their scale point.	Lower side adj. ⊘ RV201/YC-20 Upper side adj. ⊘ RV202/YC-20

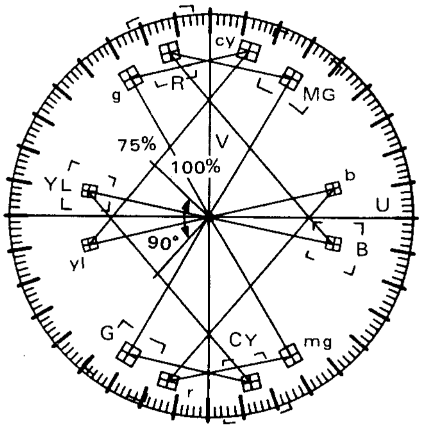
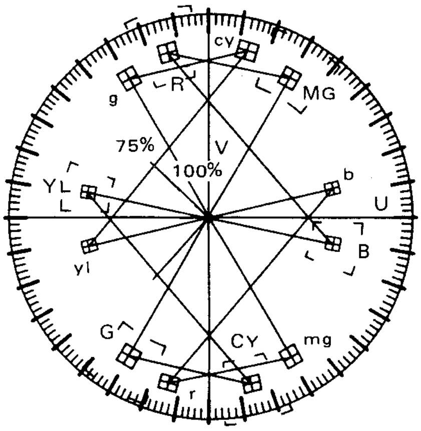
12-4-3. Mix Level Adjustment

machine conditions for adjustment	spec.	adjustment
- VIDEO IN: Color bar signal. - EE mode. - Oscilloscope: CHOP mode.	TP207/YC-20: CH-1  TP201/YC-20: CH-2  A = B	⊘ CH-1 level control volume on the oscilloscope TRIG; TP1/YC-20
	TP207/YC-20: CH-1 TP201/YC-20: CH-2  Equalize the center level of both waveforms.	⊘ RV203/YC-20 TRIG; TP1/YC-20

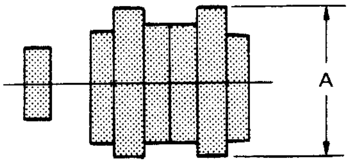
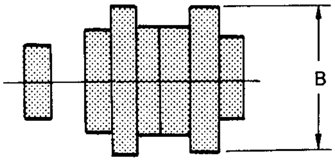
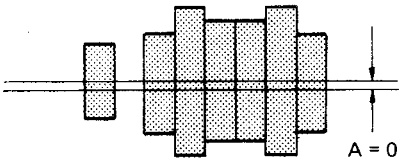
12-4-4. Process Level and Delay Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
• VIDEO IN: Color bar signal. • EE mode. • Oscilloscope: CHOP mode.	TP207/YC-20: CH-1  TP206/YC-20: CH-2  A = 2B	⊘ RV205/YC-20 TRIG; TP1/YC-20
• Adjust the level control volume of oscilloscope so that CH-1 level is equal to CH-2 level. • VIDEO IN: Color bar signal. • EE mode. • Oscilloscope: ADD mode. (CH-2: Invert)	TP207/YC-20: CH-1 TP206/YC-20: CH-2  Minimize this level.	⊘ RV204/YC-20 TRIG; TP1/YC-20
• VIDEO IN: Color bar signal. • EE mode. • Oscilloscope: CHOP mode.	TP207/YC-20: CH-1  TP206/YC-20: CH-2  A = 2B	⊘ RV205/YC-20 TRIG; TP1/YC-20

12-4-5. Slice Level Adjustment

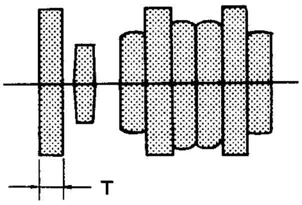
machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • EE mode.	Step 1. TP208/YC-20; Lower side adj. TP209/YC-20; Upper side adj.  cy R MG g 75% V 100% b YL U 90° B yl G CY mg r All spots (except burst signal) are within the specified scale point on the vectorscope screen.	⊘ phase control volume and gain control volume on the vectorscope
	Step 2. TP208/YC-20; Lower side adj. TP209/YC-20; Upper side adj.  cy R MG g 75% V 100% b YL U B yl G CY mg r Adjust RV201/202 so that two burst spots are within the specified scale point. Adjust step 1 and step 2 repeatedly so that all spots are within their scale point.	Lower side adj. ⊘ RV206/YC-20 Upper side adj. ⊘ RV207/YC-20

12-4-6. Mix Level Adjustment

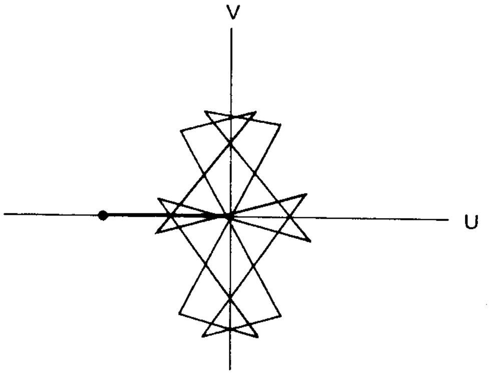
machine conditions for adjustment	spec.	adjustment
- VIDEO IN: Color bar signal. - EE mode. - Oscilloscope: CHOP mode.	TP201/YC-20: CH-1  TP210/YC-20: CH-2  A = B	⊘ CH-1 level control volume on the vectorscope TRIG; TP2/YC-20
	⇩ TP201/YC-20: CH-1 TP210/YC-20: CH-2  Equalize the center level of both waveforms.	⊘ RV208/YC-20 TRIG; TP2/YC-20

12-4-7. Pilot Burst Adjustment

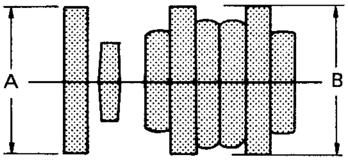
Step 1. Pilot Burst Width Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • Put the machine into EE mode using KSP cassette.	TP8/CR-26  $T = 3.7\,\mu\text{sec} \pm 0.2\,\mu\text{sec}$	⊘ RV10/CR-26 TRIG; TP1/CR-26

Step 2. Pilot Burst Phase Adjustment

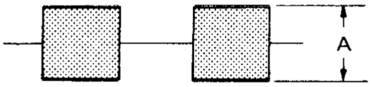
machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • Put the machine into EE mode using KSP cassette. • Observe the waveform at TP8 on CR-26 board using a vectorscope.	TP8/CR-26  Pilot Burst Phase = 180° ± 1°	⊘ LV1/CR-26

Step 3. Pilot Burst Level Adjustment

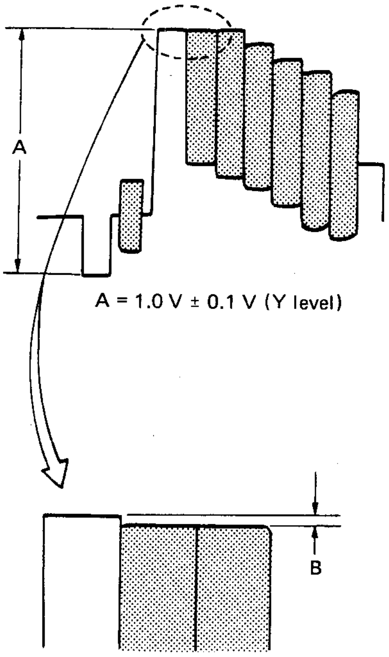
machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • Put the machine into EE mode using KSP cassette.	TP8/CR-26  A = B	⊘ RV11/CR-26 TRIG; TP1/CR-26

Step 4. Adjust section 12-1-1 Step 3 RF Level Adjustment.

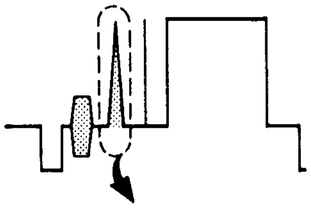
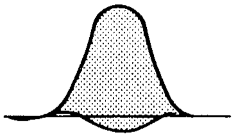
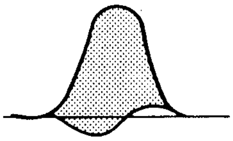
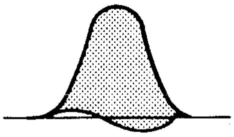
12-4-8. Chroma REC Current Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • Short TP3–TP4/RP-24. • Short TP5–TP6/RP-24. • Short TP8–E1/RP-24. • Disconnect the shorting plugs CP1 and CP2 on RP-24 board. • Put the machine into REC mode using KSP cassette.	TP3–TP4/RP-24 Current waveform observed using a current probe.  A = 16 mA ± 4 mA	⊘ RV2/RP-24

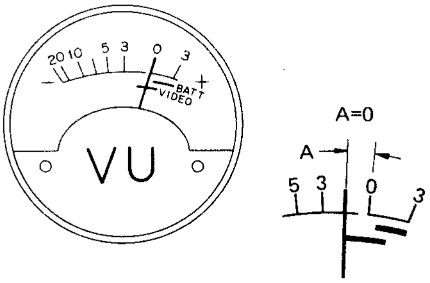
12-4-9. EE Y and Chroma Level Adjustment

machine conditions for adjustment	**spec.**	**adjustment**
• VIDEO IN: Color bar signal. • Put the machine into EE mode using KCS cassette.	VIDEO OUT (75 ohm terminated)  A = 1.0 V ± 0.1 V (Y level) B = 0 ± 20 mV (Chroma level)	Y level adj. ⊘ RV111/VO-12 Chroma level adj. ⊘ RV51/VO-12

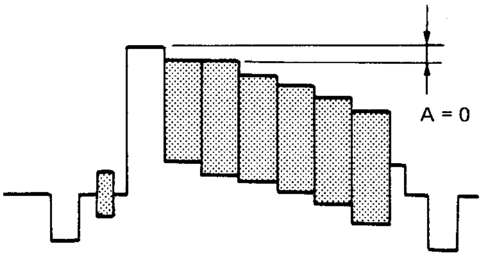
12-4-10. REC Y/C Delay Adjustment

machine conditions for adjustment	spec. & adjustment
• VIDEO IN: MOD 10T pulse signal. • Play back the self-recorded portion using KSP cassette.	TP52/VO-12  ① Y and Chroma signals are in phase.  ② Chroma signal is advanced.  ③ Chroma signal is delayed.  ⊘ DL551/VO-12 TRIG; INT • Select the suitable tap according to short any taps of DL551/VO-12 board so that the waveform meets the fig. ①. • Each one tap is 0.05 μsec delayed. • The fig ③ shows that the chroma signal is delayed from the fig ①.

12-4-11. Video Meter Adjustment

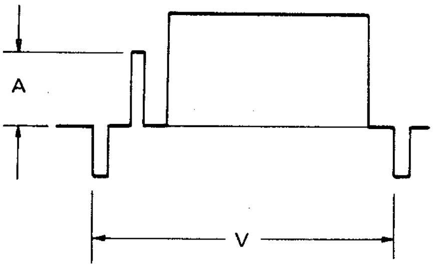
machine conditions for adjustment	spec.	adjustment
• Meter Select SW → Video • VIDEO IN: Color bar signal. • EE mode.		⊘ RV110/VO-12

12-4-12. Chroma ~~Mix~~ Level Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN: Color bar signal. • Play back the color bar segment of conventional Alignment tape.	VIDEO OUT (75 ohm terminated)  A = 0 ± 20 mV	⊘ RV502/VO-12 TRIG; INT

12-5. TIME CODE SYSTEM ALIGNMENT

12-5-1. VITC Mix Level Adjustment

machine conditions for adjustment	spec.	adjustment
• Connect the BKU-150P. • VIDEO IN: Color bar signal. • Put the machine into EE mode using KCS cassette.	TP52/VO-12  A = 1.12 V ± 0.08 V	⊘ RV1/VO-12 TRIG; TP210/VO-12

12-5-2. Time Code REC Current Adjustment

machine conditions for adjustment	spec.	adjustment
• Play back the time code segment of SP Alignment tape.	TP702/PA-48 Memorize the played back time code level → A dB	
• TIME CODE IN: 1.2 kHz, 0 dB • Play back the self-recorded portion using KCS cassette.	TP702/PA-48 Played back level of the self-recorded portion = A + 2 dB ± 0.5 dB	⊘ RV102/PSB-4

SONY®

PORTABLE VIDEOCASSETTE RECORDER

BVU-150P

SUPPLEMENT-3

SUBJECT

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- SECTION 18 CHANGED PARTS

Applicable Manual

1st Edition Revised13 (3-694-769-15)

Professional U-matic S SP

OPERATION AND MAINTENANCE MANUAL

BVU-150P (EK)
9-977-577-01

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B&I Products Group

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18. CHANGED PARTS

SECTION 17
SPARE PARTS AND FIXTURE

17-1. NOTES ON REPAIR PARTS

(1) Sefety Related Components Warning

> Components marked with ⚠ on the schematic diagrams, exploded views and electrical repair parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletin and service manual supplements published by Sony.

(2) Standerdization of Parts

Repair parts supplied Sony Parts Center may not be always identical with the parts which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".

This manual's exploded views and electrical parts list are indicating the parts numbers of "the standardized genuine parts at present"

(3) Changes of Parts

Regarding engineering patrs changes, refer to "Section 18 CHANGED PARTS"

(4) Stock of Parts

Rarts marked with "o" SP (Supply Code) column of the repair parts list are not normally required for routine service work.

Orders for parts marked with "o" will be processed, but allow for additional delivery time.

(5) Units for Capacitors, Inductors and Resistors

The following units may be assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified.

Capacitors : µF
Inductors : µH
Resistors : Ω

(6) Tension Spring

(xxT) after a tension spring is shown on the parts list in order to indicate the number of spring turns required for the use.

(Example) TENSION, SPRING (20T):
This spring must be cut at its 20th turn for actual use.

17-2. EXPLODED VIEW

- Exploded views are composed of the following blocks

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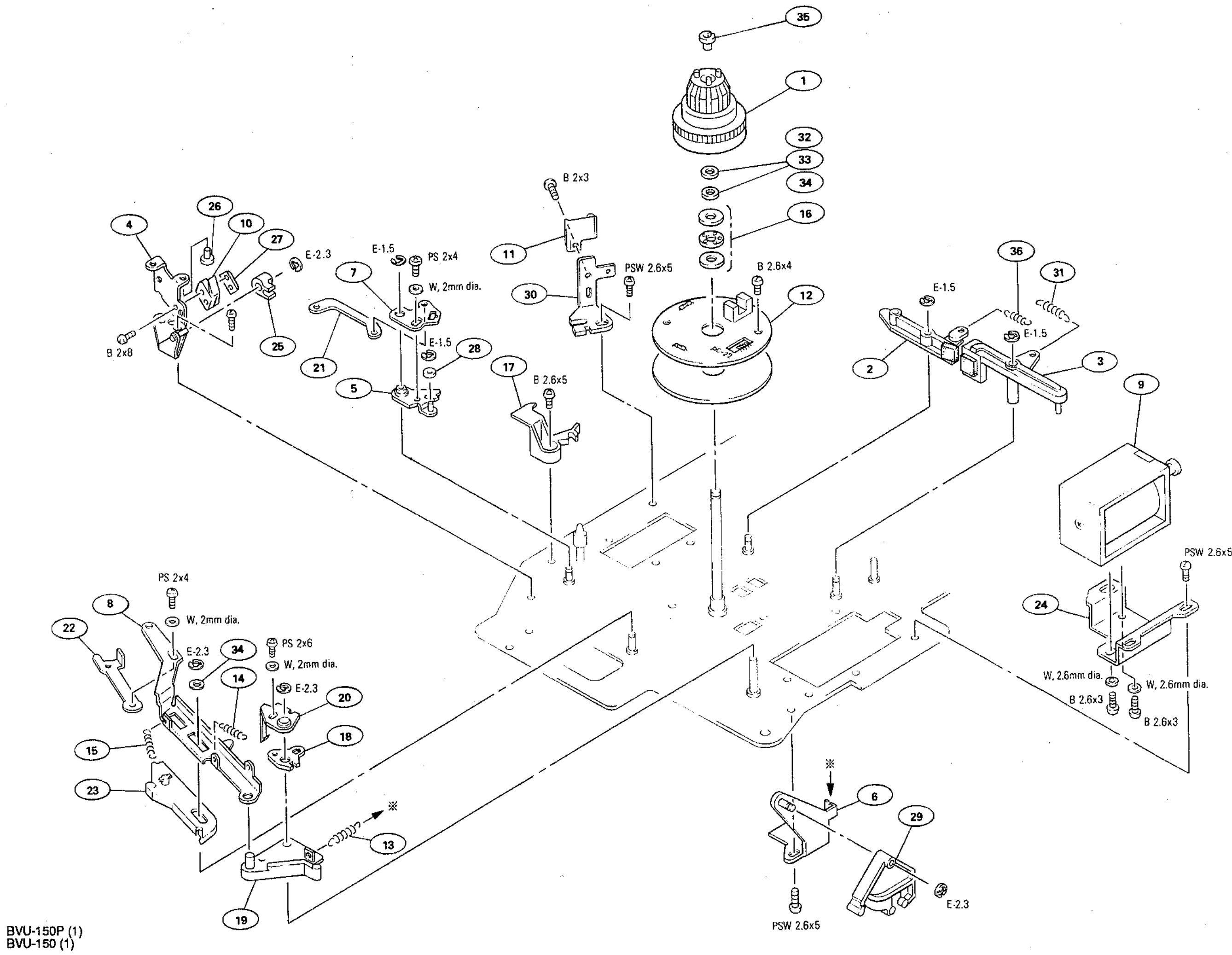
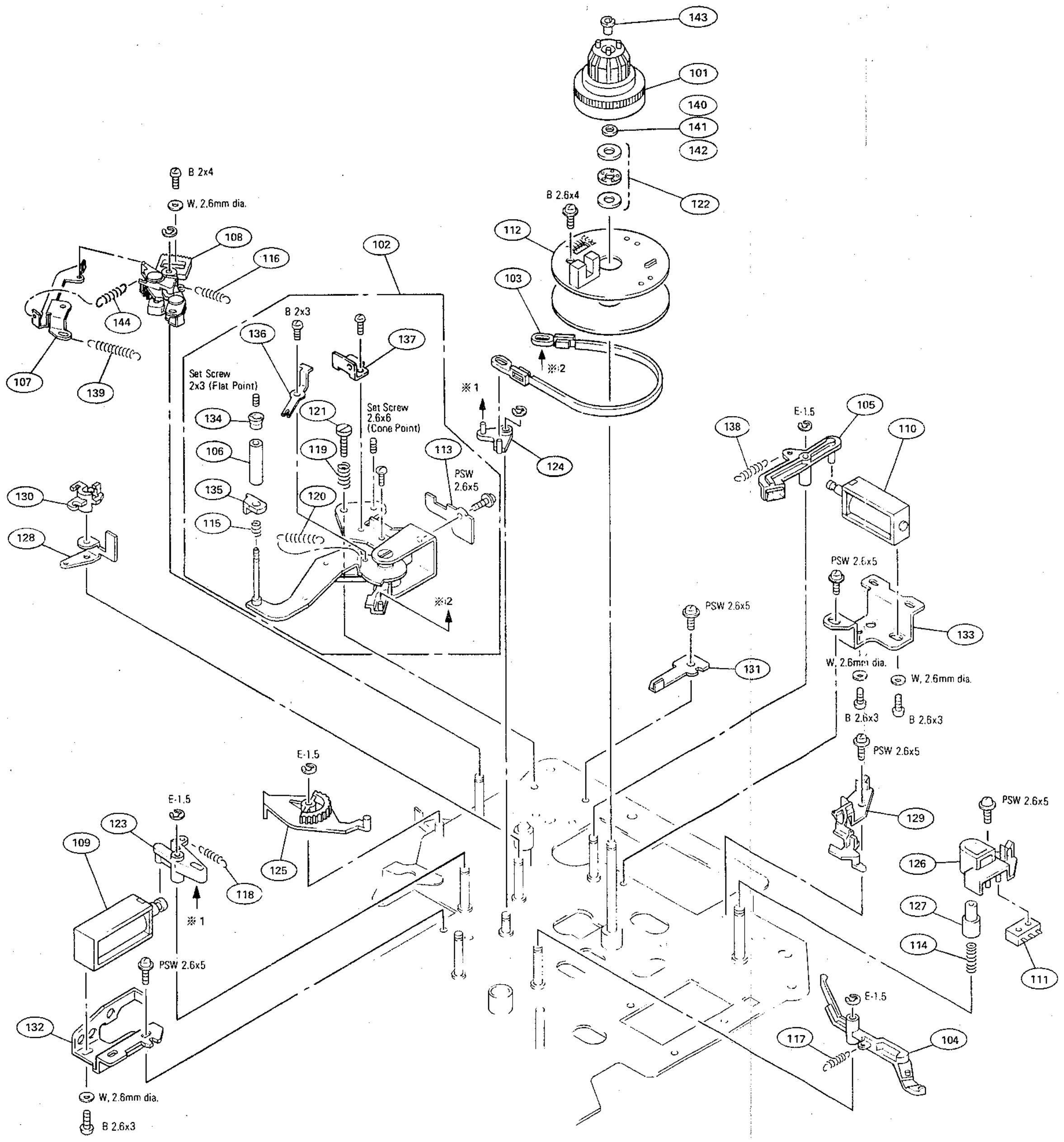
Reel Chassis Block (1) (Take-up Side)



BVU-150P (1)
BVU-150 (1)

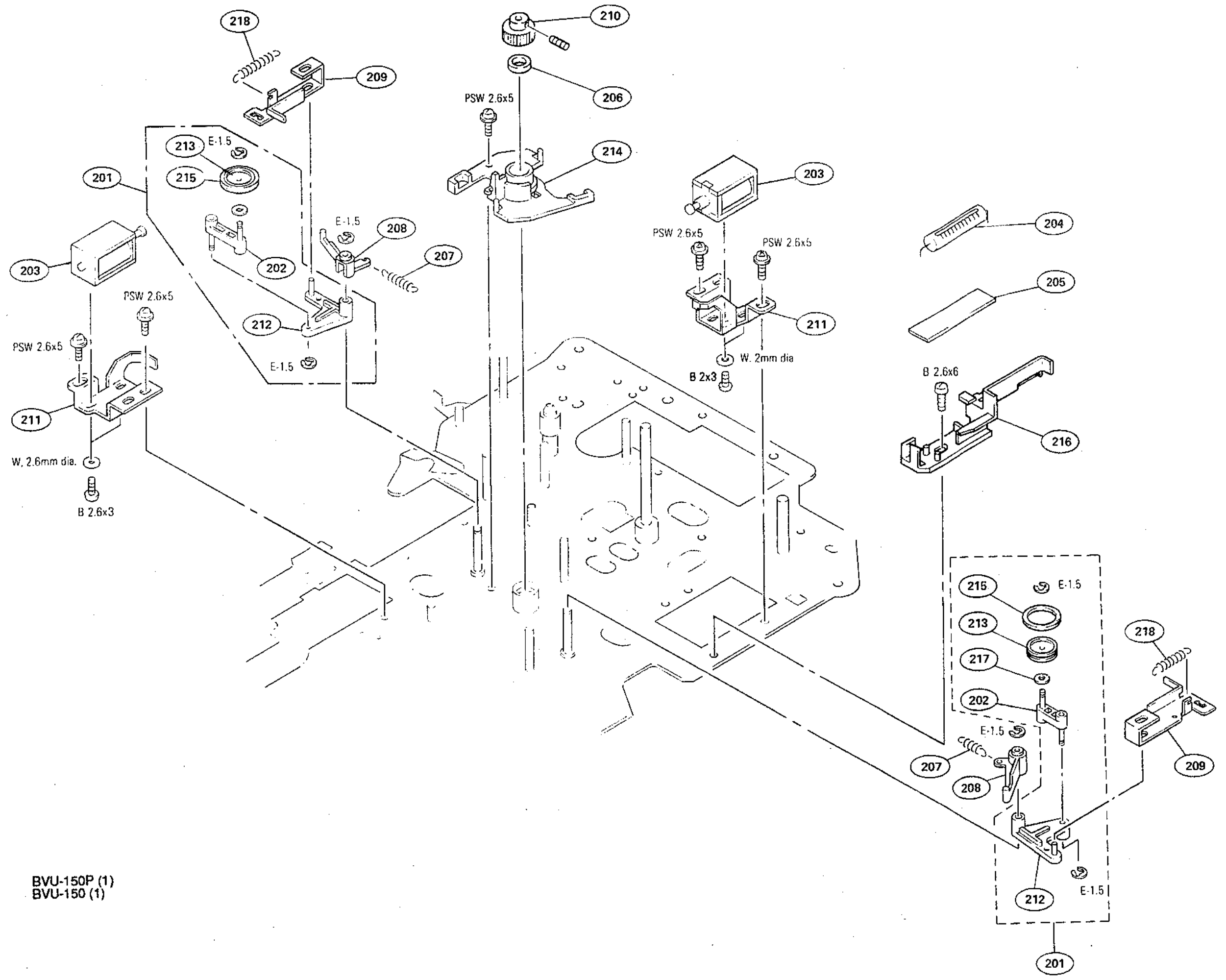
No.	Part No.	SP	Description
1	A-6739-034-A	s	TABLE ASSY, REEL
2	X-3685-818-2	s	ARM ASSY, T SOFT BRAKE
3	X-3685-819-2	s	ARM ASSY, BRAKE
4	X-3685-829-1	o	BASE ASSY, MISS RECORDING
5	X-3685-830-1	o	RING ASSY, SLIDE STOPPER
6	X-3685-831-1	o	HOLDER ASSY, VH RING
7	X-3685-833-1	o	PLATE ASSY, ADJUSTMENT, LINK
8	X-3685-838-1	o	SLIDER ASSY, E
9	1-454-383-11	s	SOLENOID, PLUNGER
10	1-570-028-11	s	SWITCH, MICRO
11	1-611-957-11	o	PRINTED CIRCUIT BOARD, LE-21
12	1-611-960-11	o	PRINTED CIRCUIT BOARD, PC-22
13	3-456-158-XX	s	SPRING, TENSION (16T)
14	3-567-029-00	s	SPRING, TENSION
15	3-573-930-00	s	SPRING, TENSION
16	3-676-322-00	s	BEARING, THRUST
17	3-685-802-01	o	GUIDE, PINCH ROLLER
18	3-685-809-01	o	PLATE, ADJUSTMENT, E. SWITCH
19	3-685-810-01	o	LINK, REPLACEMENT, H
20	3-685-811-01	s	ACTUATOR, E SWITCH
21	3-685-812-01	o	JOINT, KM
22	3-685-813-01	o	JOINT, SLIDER, E
23	3-685-814-01	s	PRESSURE, E
24	3-685-832-01	o	BASE, B-SOL
25	3-685-850-01	o	LEVER, RELEASE, C LOCK
26	3-685-851-01	o	SHAFT, MS
27	3-685-852-01	o	NUT (M2), PLATE
28	3-685-860-01	s	ROLLER, E STOPPER
29	3-685-864-01	o	LINK, VH CHANGE
30	3-685-867-01	o	PLATE, S-LED
31	3-686-070-01	s	SPRING, TENSION
32	3-701-439-01	s	WASHER, POLY 3MM DIA., 0.13T
33	3-701-439-11	s	WASHER, POLY 3MM DIA,. 0.25T
34	3-701-439-21	s	WASHER, POLY 3MM DIA,. 0.5T
35	3-703-074-01	s	CAP 3, SHAFT
36	4-847-057-00	s	SPRING, TENSION

Reel Chassis Block (2) (Supply Side)



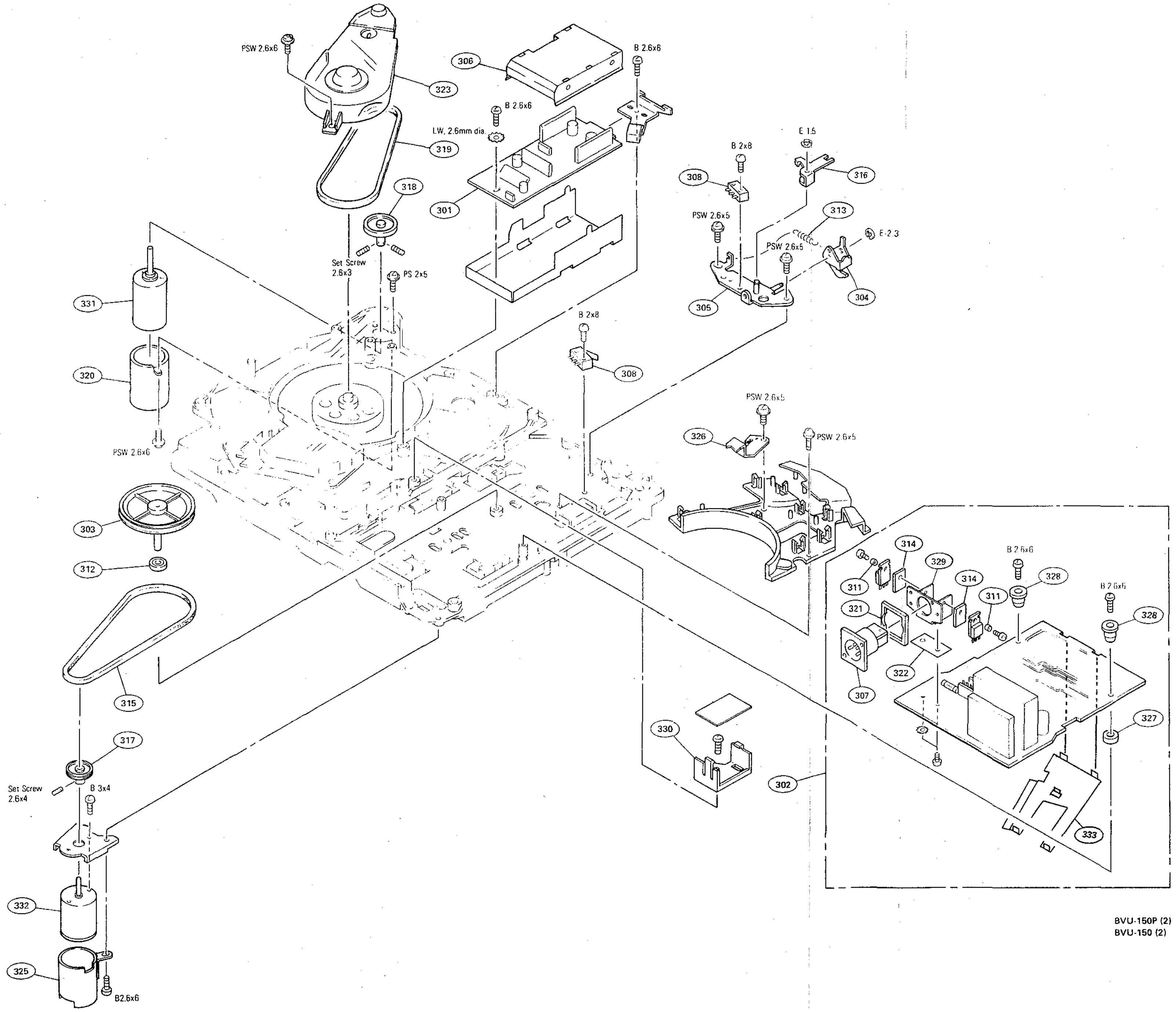
No.	Part No.	SP	Description
101	A-6739-034-A	s	TABLE ASSY, REEL
102	A-6742-055-E	s	TENSION REGULATOR ASSY
103	X-3685-814-4	s	BAND ASSY, TENSION REGULATOR
104	X-3685-817-2	s	ARM ASSY, S SOFT BRAKE
105	X-3685-819-2	s	ARM ASSY, BRAKE
106	X-3685-820-1	s	ROLLER ASSY, T.R
107	X-3685-865-1	o	ARM (C) ASSY, T.R DRAWR
108	X-3685-866-1	o	ARM SUB ASSY, T.R DRAWER
109	1-454-382-11	s	SOLENOID, PLUNGER
110	1-454-383-11	s	SOLENOID, PLUNGER
111	1-570-028-21	s	SWITCH, MICRO
112	1-611-960-11	o	PRINTED CIRCUIT BOARD, PC-22
113	1-611-963-11	o	PRINTED CIRCUIT BOARD, DUS-4
114	2-527-096-00	s	SPRING, COMPRESSION
115	3-305-432-00	s	SPRING, COMPRESSION
116	3-424-031-00	s	SPRING, RECORD SLIDER
117	3-508-108-XX	s	SPRING, TENSION (12T)
118	3-533-373-00	s	SPRING, TENSION
119	3-534-237-00	s	SPRING, COMPRESSION
120	3-555-212-00	s	SPRING, TENSION
121	3-650-191-11	s	SCREW, LOCK
122	3-676-322-00	s	BEARING, THRUST
123	3-685-815-02	o	ARM (A), RELEASE, T.R
124	3-685-816-01	o	ARM (B), RELEASE, T.R
125	3-685-817-01	o	ARM (A), DRAWER, T.R
126	3-685-820-01	o	COVER, SWITCH
127	3-685-821-01	o	PIN, SWITCH
128	3-685-826-01	s	ARM, RELEASE, S SOFT
129	3-685-827-01	o	HOLDER, BAND
130	3-685-828-01	o	COVER, SHAFT
131	3-685-829-03	o	STOPPER, TENSION REGULATOR
132	3-685-831-01	o	BASE, T.R.SOL
133	3-685-832-01	o	BASE, B-SOL
134	3-685-839-04	s	NUT, ADJUSTMENT, T.R
135	3-685-840-02	s	FRANGE (LOWER), T.R
136	3-685-842-01	o	ARM, MAGNET
137	3-731-689-01	o	HOLDER, SPRING
138	3-686-070-01	s	SPRING, TENSION
139	3-686-071-03	s	SPRING, TENSION
140	3-701-439-01	s	WASHER, POLY 3MM DIA., 0.13T
141	3-701-439-11	s	WASHER, POLY 3MM DIA., 0.25T
142	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
143	3-703-074-01	s	CAP 3, SHAFT
144	3-672-461-01	s	SPRING, TENSION

Reel Chassis Block (3) (Driving Block)



No.	Part No.	SP	Description
201	A-6740-084-A	o	IDLER ASSY
203	1-454-381-11	s	SOLENOID, PLUNGER
204	1-548-119-21	s	HOURS METER
205	1-613-881-11	o	PRINTED CIRCUIT BOARD, TM-19
206	3-154-507-02	s	BEARING, BALL
207	3-537-783-XX	s	SPRING, TENSION (18T)
208	3-685-822-01	o	ARM, IDLER RELEASE
209	3-685-823-01	o	PLATE, PRESS, IDLER
210	3-685-824-01	o	PULLEY, MIDWAY
211	3-685-833-01	o	BASE, I-SOL
212	3-685-835-01	s	ARM (B), IDLER
213	3-685-836-01	o	PULLEY, IDLER
214	3-685-972-01	o	RETAINER, IDLER
215	3-687-902-01	s	TIRE, IDLER
216	3-687-903-01	o	HOLDER, H. M
217	3-701-437-21	s	WASHER, POLY 2MM DIA., 0.5T
218	4-812-499-XX	s	SPRING, TENSION (15T)

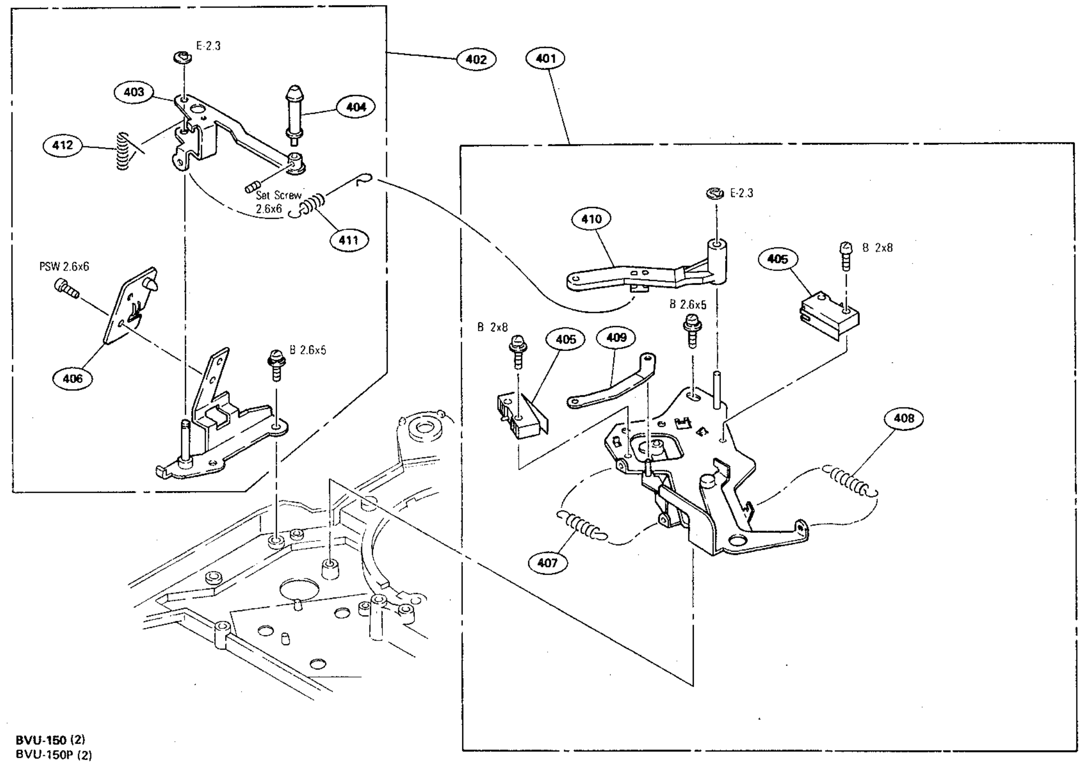
Reel Chassis Block (4) (Back Side)



BVU-150P (2)
BVU-150 (2)

No.	Part No.	SP	Description
301	A-6711-650-A	o	MOUTED CIRCUIT BOARD, RP-24
302	A-6723-281-A	o	MOUTED CIRCUIT BOARD, PSB-4
303	X-3685-810-1	s	PULLEY ASSY, RELAY
304	X-3685-827-1	o	ARM ASSY, C LOCK
305	X-3685-828-1	o	BRACKET ASSY, C LOCK ARM
306	X-3685-864-1	o	PLATE (B) ASSY, SHIELD, RP
307	1-560-999-11	s	CONNECTOR (WITH DC SW) 4P
308	1-570-028-21	s	SWITCH, MICRO
311	2-832-007-00	s	BUSHING (K), INSULATING
312	3-154-507-02	s	BEARING, BALL
313	3-571-819-00	s	SPRING, TENSION
314	3-660-978-00	s	SHEET, HEAT RESISTING
315	3-685-803-02	s	BELT, REEL
316	3-685-855-01	o	LEVER, SWITCH, LOCK
317	3-685-902-02	s	PULLEY, MOTOR
318	3-686-016-01	s	PULLEY, D MOTOR
319	3-657-003-00	s	BELT, DRUM
320	3-686-044-01	o	PLATE, SHIELD, M
321	3-682-918-00	o	SPACER (A), XLR
322	3-686-053-01	o	SHEET, INSULATING, HEAT SINK
323	3-686-095-01	o	COVER, D PULLEY
325	3-687-921-01	o	CASE, SHIELD
326	3-687-947-01	o	PLATE, ELECTROSTATIC
327	3-694-704-01	o	SPACER
328	3-694-705-01	o	PIN, SPACER
329	3-694-724-01	o	BRACKET (B), DC IN
330	3-694-732-01	o	HOLDER, BA
331	8-835-030-01	s	MOTOR, DC (MNR-2900A) (UC: S/N UP TO 11260) (J: S/N UP TO 10155) (EK: S/N UP TO 11820)
	8-835-235-01	s	MOTOR, DC (MNR-2900B) (UC: S/N 11261 AND HIGHER) (J: S/N 10156 AND HIGHER) (EK: S/N 11821 AND HIGHER)
332	8-835-123-01	s	MOTOR, DC (MNR-7400A)
333	X-3694-715-1	o	PLATE ASSY, SHIELD, PSB

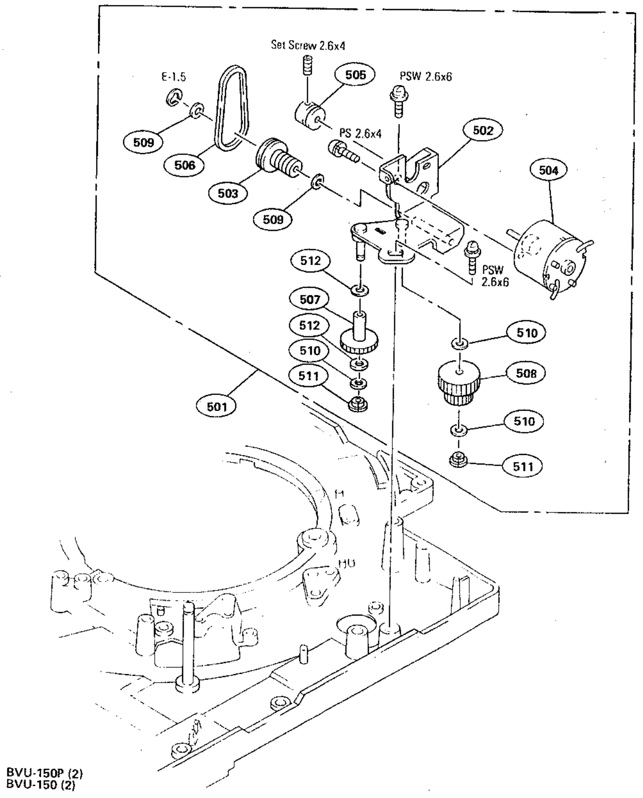
T.U Arm and Ring Stopper Blocks



BVU-150 (2)
BVU-150P (2)

No.	Part No.	SP	Description
401	A-6744-016-D	o	STOPPER ASSY, RING
402	A-6746-038-G	o	ARM ASSY, TU
403	X-3685-824-3	o	ARM ASSY, T
404	X-3685-858-1	s	ROLLER ASSY, T GUIDE
405	1-570-028-11	s	SWITCH, MICRO
406	1-611-956-11	o	PRINTED CIRCUIT BOARD, LE-20
407	3-515-170-00	s	SPRING, TENSION
408	3-535-369-XX	s	SPRING, TENSION (12T)
409	3-685-812-01	o	JOINT, KM
410	3-685-903-03	s	ARM, DRAWER
411	3-686-005-04	s	SPRING, TENSION
412	3-686-006-01	s	SPRING

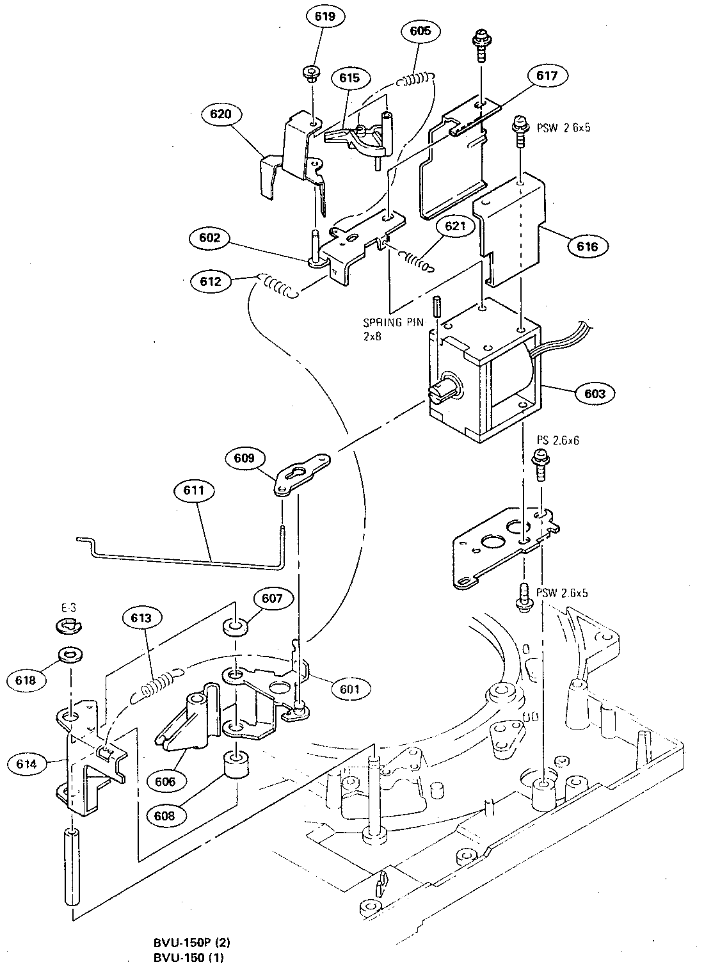
Threading Motor Block



BVU-150P (2)
BVU-150 (2)

No.	Part No.	SP	Description
501	A-6737-138-E	o	GEAR ASSY, LD
502	X-3685-845-2	o	BASE ASSY, LD GEAR
503	X-3685-851-1	s	GEAR ASSY, WORM
504	1-541-163-51	s	MOTOR
505	3-686-009-01	s	PULLEY, LD
506	3-686-010-03	s	BELT, LD
507	3-686-011-02	s	GEAR, THREADING
508	3-686-012-01	s	GEAR, DRIVE
509	3-701-437-11	s	WASHER, POLY 2MM DIA., 0.25T
510	3-701-439-21	s	WASHER, POLY 3MM DIA., 0.5T
511	3-703-074-01	s	CAP 3, SHAF
512	3-701-439-11	s	WASHER, POLY 3MM DIA., 0.25T

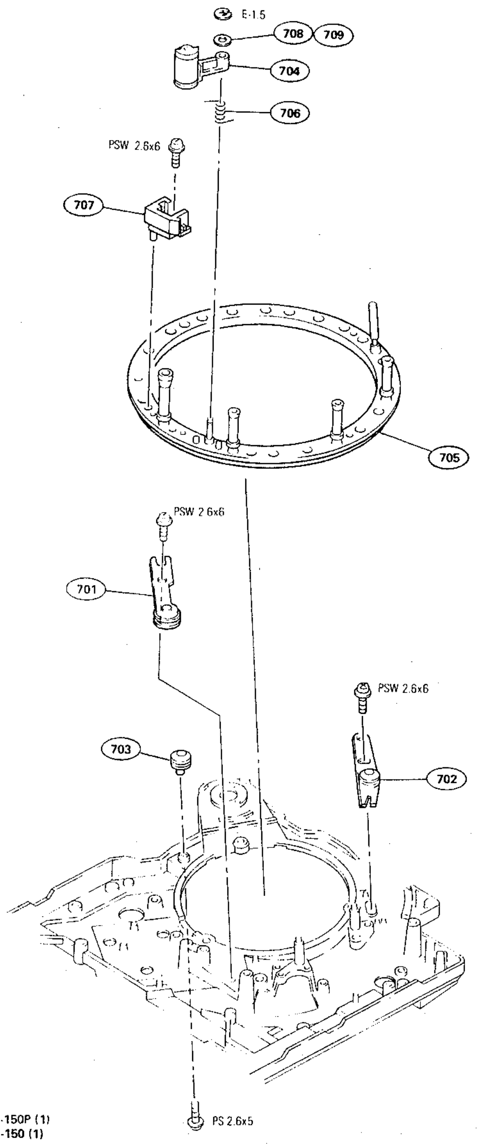
Pinch Pressure Block



BVU-150P (2)
BVU-150 (1)

No.	Part No.	SP	Description
601	X-3685-822-1	o	LEVER ASSY, CHARGE
602	X-3685-852-3	o	PLATE ASSY, ADJUSTMENT, S
603	1-454-386-11	s	SOLENOID, PLUNGER
605	3-668-508-11	s	SPRING, TENSION
606	3-685-927-03	s	STOPPER, TAPE
607	3-685-929-01	o	SPACER
608	3-685-929-11	o	SPACER
609	3-685-931-01	o	JOINT
611	3-685-998-01	o	JOINT
612	3-686-003-01	s	SPRING, TENSION
613	3-686-004-01	s	SPRING, TENSION
614	3-686-007-01	o	PLATE, PRESS, PINCH
615	3-687-905-02	o	PLATE, J
616	3-687-925-01	o	PLATE, SHIELD, PSOL
617	3-687-963-03	o	PLATE (2), SHIELD, PSOL
618	3-701-441-21	s	WASHER, POLY 4MM DIA., 0.5T
619	3-703-075-00	s	CAP 2, SHAFT
620	3-687-978-01	o	ARM, PM
621	3-555-125-00	s	SPRING, TENSION (EK: S/N 10021 AND HIGHER)

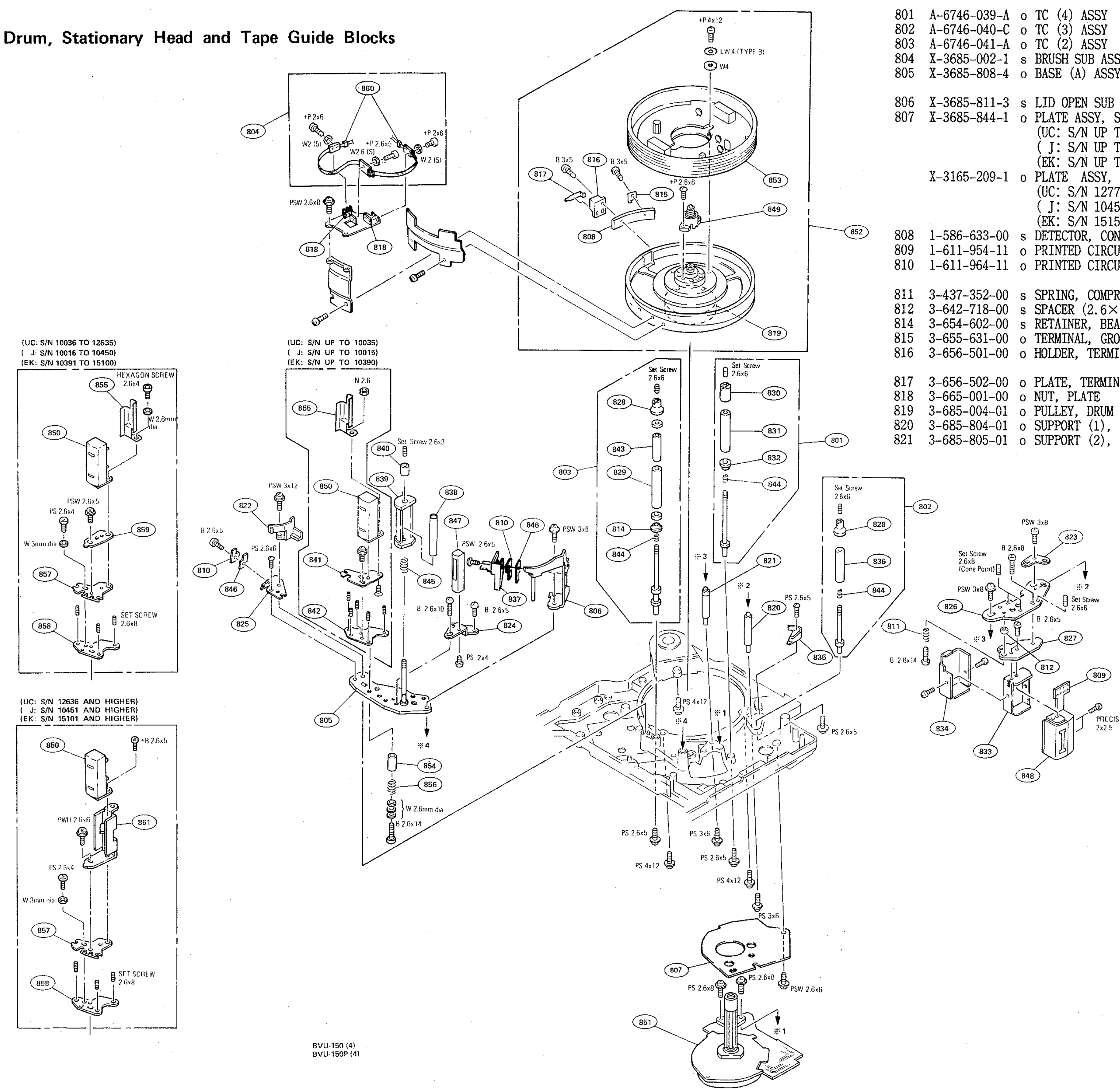
Threading Ring Block



BVU-150P (1)
BVU-150 (1)

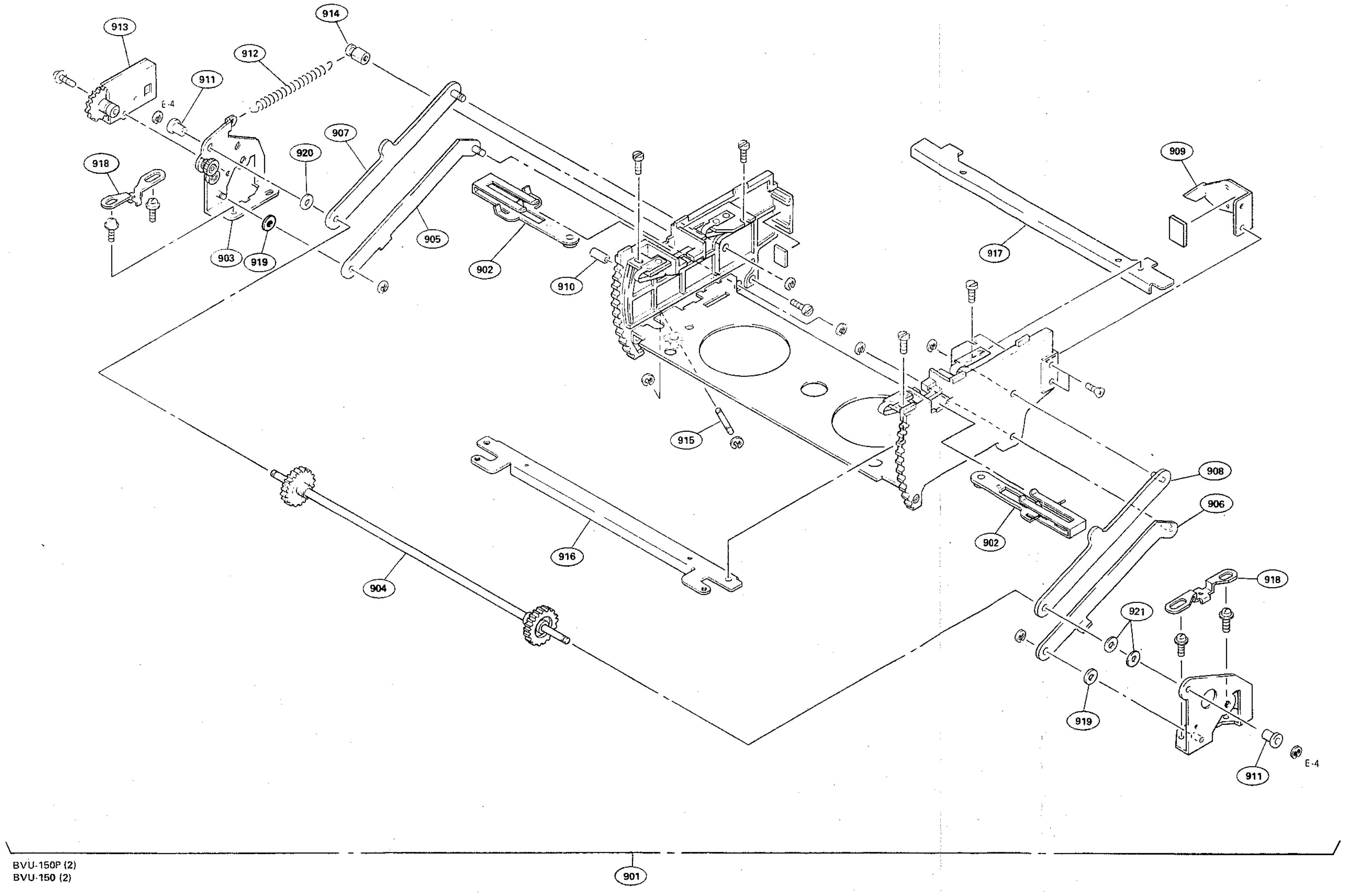
No.	Part No.	SP	Description
701	X-3685-801-1	o	SUPPORT (A) ASSY, R
702	X-3685-802-1	o	SUPPORT (B) ASSY, R
703	X-3685-803-1	o	SUPPORT (C) ASSY, R
704	X-3685-804-1	s	ARM ASSY, P
705	X-3685-809-7	s	RING SUB ASSY, THREADING
706	3-685-934-01	s	SPRING
707	3-685-994-02	o	BASE, TR THREAD
708	3-701-439-01	s	WASHER, POLY 2MM DIA., 0.13T
709	3-701-437-11	s	WASHER, POLY 2MM DIA., 0.25T

Head Drum, Stationary Head and Tape Guide Blocks



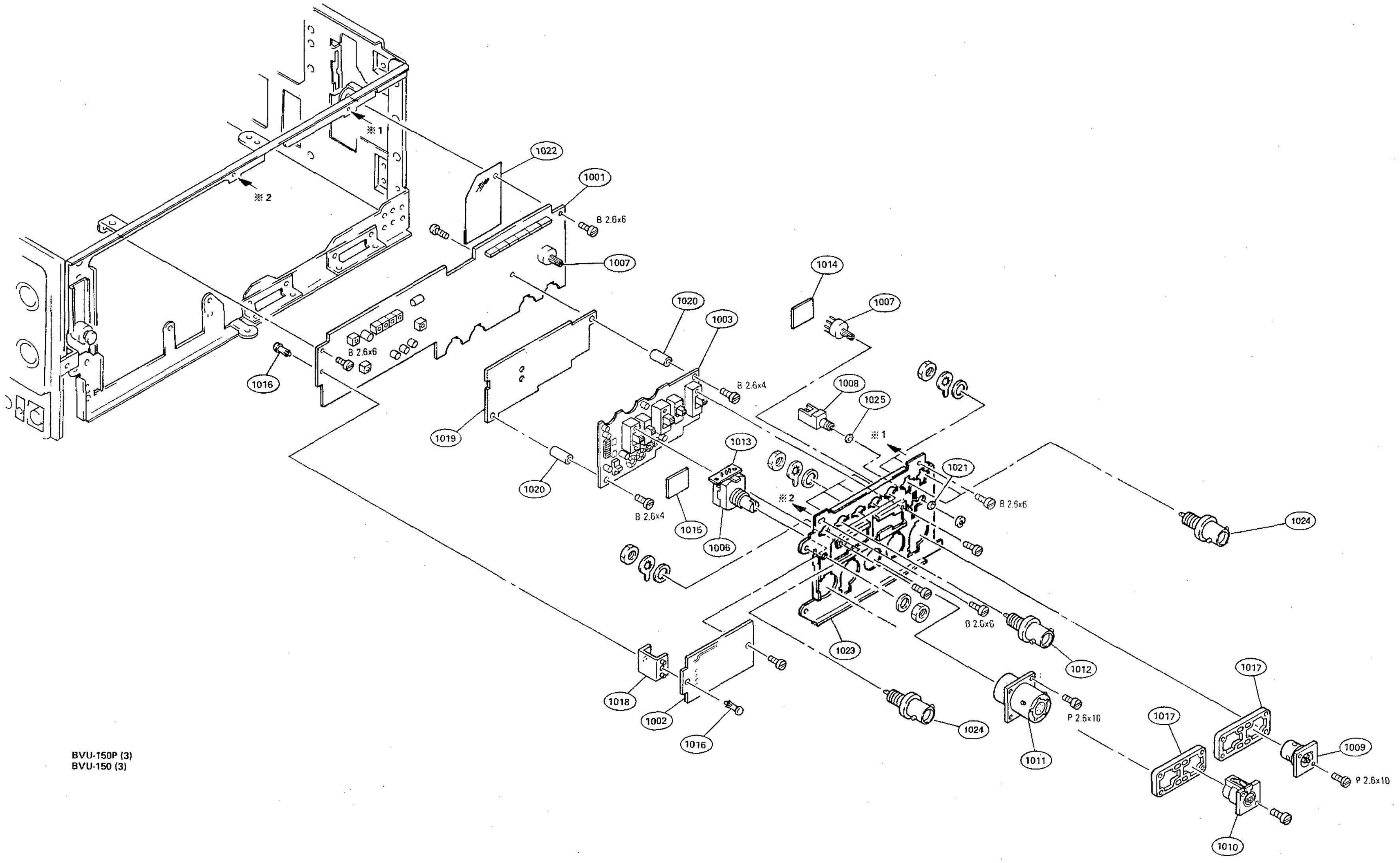
No.	Part No.	SP	Description
801	A-6746-039-A	o	TC (4) ASSY
802	A-6746-040-C	o	TC (3) ASSY
803	A-6746-041-A	o	TC (2) ASSY
804	X-3685-002-1	s	BRUSH SUB ASSY
805	X-3685-808-4	o	BASE (A) ASSY, EN
806	X-3685-811-3	s	LID OPEN SUB ASSY
807	X-3685-844-1	o	PLATE ASSY, SHIELD, CPS (UC: S/N UP TO 12775) (J: S/N UP TO 10450) (EK: S/N UP TO 15150)
	X-3165-209-1	o	PLATE ASSY, SHIELD, CPS (UC: S/N 12776 AND HIGHER) (J: S/N 10451 AND HIGHER) (EK: S/N 15151 AND HIGHER)
808	1-586-633-00	s	DETECTOR, CONDENSATION
809	1-611-954-11	o	PRINTED CIRCUIT BOARD, DU-58
810	1-611-964-11	o	PRINTED CIRCUIT BOARD, DUS-5
811	3-437-352-00	s	SPRING, COMPRESSION
812	3-642-718-00	s	SPACER (2.6×10)
814	3-654-602-00	s	RETAINER, BEARING
815	3-655-631-00	o	TERMINAL, GROUND
816	3-656-501-00	o	HOLDER, TERMINAL
817	3-656-502-00	o	PLATE, TERMINAL
818	3-665-001-00	o	NUT, PLATE
819	3-685-004-01	o	PULLEY, DRUM
820	3-685-804-01	o	SUPPORT (1), EX
821	3-685-805-01	o	SUPPORT (2), EX
822	3-685-806-01	o	RETAINER, TAPE
823	3-685-807-01	o	PLATE, ADJ
824	3-685-896-01	o	BASE, ERASE
825	3-685-897-03	o	BRACKET, T. D
826	3-685-899-01	o	BASE (A), EX
827	3-685-900-01	o	BASE (B), EX
828	3-685-920-01	s	FLANGE, TAPE
829	3-685-921-01	s	GUIDE, TAPE
830	3-685-924-01	s	FLANGE (U), EX
831	3-685-925-01	s	GUIDE, EX
832	3-685-926-01	s	FLANGE (L), EX
833	3-685-978-01	o	CASE, AU
834	3-685-979-01	o	CASE (REAR), AU
835	3-686-001-01	o	RETAINER (2), TAPE
836	3-686-020-03	s	GUIDE, TAPE
837	3-687-951-01	s	VISOR, INFRARED RAYS
838	3-687-968-01	s	GUIDE, TG-1
839	3-687-969-01	s	FLANGE, TG-1
840	3-687-970-01	s	SCREW, TG-1
841	3-694-702-01	o	BASE (C), EN (UC: S/N UP TO 10035) (J: S/N UP TO 10015) (EK: S/N UP TO 10390)
842	3-694-711-01	o	BASE (B), EN (UC: S/N UP TO 10035) (J: S/N UP TO 10015) (EK: S/N UP TO 10390)
843	4-855-006-01	s	SPACER (3×12)
844	4-866-143-00	s	SPRING, COMPRESSION
845	4-868-051-01	o	SPRING, COMPRESSION
846	8-719-919-10	s	DIODE 55M22LS
847	8-825-544-20	s	HEAD, ERASE
848	8-825-578-22	s	HEAD, ACE (EPS264-5803)
849	8-825-680-50	s	RING ASSY, SLIP (VO-SR5)
850	8-829-371-11	s	HEAD, T/C (PP171-5802D) (UC: S/N UP TO 12635) (J: S/N UP TO 10450) (EK: S/N UP TO 15100)
	8-825-771-31	s	HEAD, T/C (PP295-58) (UC: S/N 12636 AND HIGHER) (J: S/N 10451 AND HIGHER) (EK: S/N 15101 AND HIGHER)
851	8-838-079-01	s	MOTOR, DC (BHF-1913A)
852	A-6709-527-A	s	HEAD DRUM ASSY, DUH-30A-R
853	A-6709-528-A	s	UPPER DRUM ASSY, DUR-30-R
854	3-642-719-01	o	SPACER (2.6×11)
855	3-698-905-01	o	PLATE, SHIELD, TC HEAD (UC: S/N UP TO 12635) (J: S/N UP TO 10450) (EK: S/N UP TO 15100)
856	3-698-906-01	s	SPRING, COMPRESSION
857	3-698-912-01	o	BASE (C-2), EN (UC: S/N 10036 AND HIGHER) (J: S/N 10016 AND HIGHER) (EK: S/N 10391 AND HIGHER)
858	3-698-914-01	o	BASE (B-2), EN (UC: S/N 10036 AND HIGHER) (J: S/N 10016 AND HIGHER) (EK: S/N 10391 AND HIGHER)
859	3-698-915-01	o	BASE (D-2), EN (UC: S/N 10036 AND HIGHER) (J: S/N 10016 AND HIGHER) (EK: S/N 10391 AND HIGHER)
860	3-641-645-00	s	BRUSH
861	3-731-620-01	o	BRACKET, TC (UC: S/N 12636 AND HIGHER) (J: S/N 10451 AND HIGHER) (EK: S/N 15101 AND HIGHER)

Cassette-up Compartment Block



No.	Part No.	SP	Description
901	A-6751-200-D		CASSETTE COMPARTMENT ASS
902	X-3657-049-0		RETAINER ASSY, C REEL
903	X-3685-826-2		HOLDER (L) ASSY, C
904	X-3685-832-2		GEAR ASSY, T
905	X-3685-834-3		ARM (LEFT LOWER) ASSY, C
906	X-3685-835-1		ARM (RIGHT LOWER) ASSY, C
907	X-3685-836-1		ARM (LEFT UPPER) ASSY, C
908	X-3685-837-1		ARM (RIGHT UPPER) ASSY, C
909	3-657-119-03		PLATE, RELEASE, (C) LID LOCK
910	3-657-120-04		ROLLER
911	3-657-195-00		SLEEVE, C
912	3-657-238-00		SPRING, TENSION
913	3-681-528-00		DAMPER
914	3-685-954-01		HOOK, SPRING, C
915	3-685-946-01		PIN, LOCK, LEVER, E
916	3-685-947-01		STAY (FRONT), C 10-916
917	3-685-948-01		STAY (REAR), C 10-917
918	3-685-949-01		RETAINER, SPRING 10-918
919	3-701-441-21		WASHER, POLY 3MM DIA., 0.5T
920	3-701-444-11		WASHER, POLY 6MM DIA., 0.25T
921	3-701-444-21		WASHER, POLY 6MM DIA., 0.5T

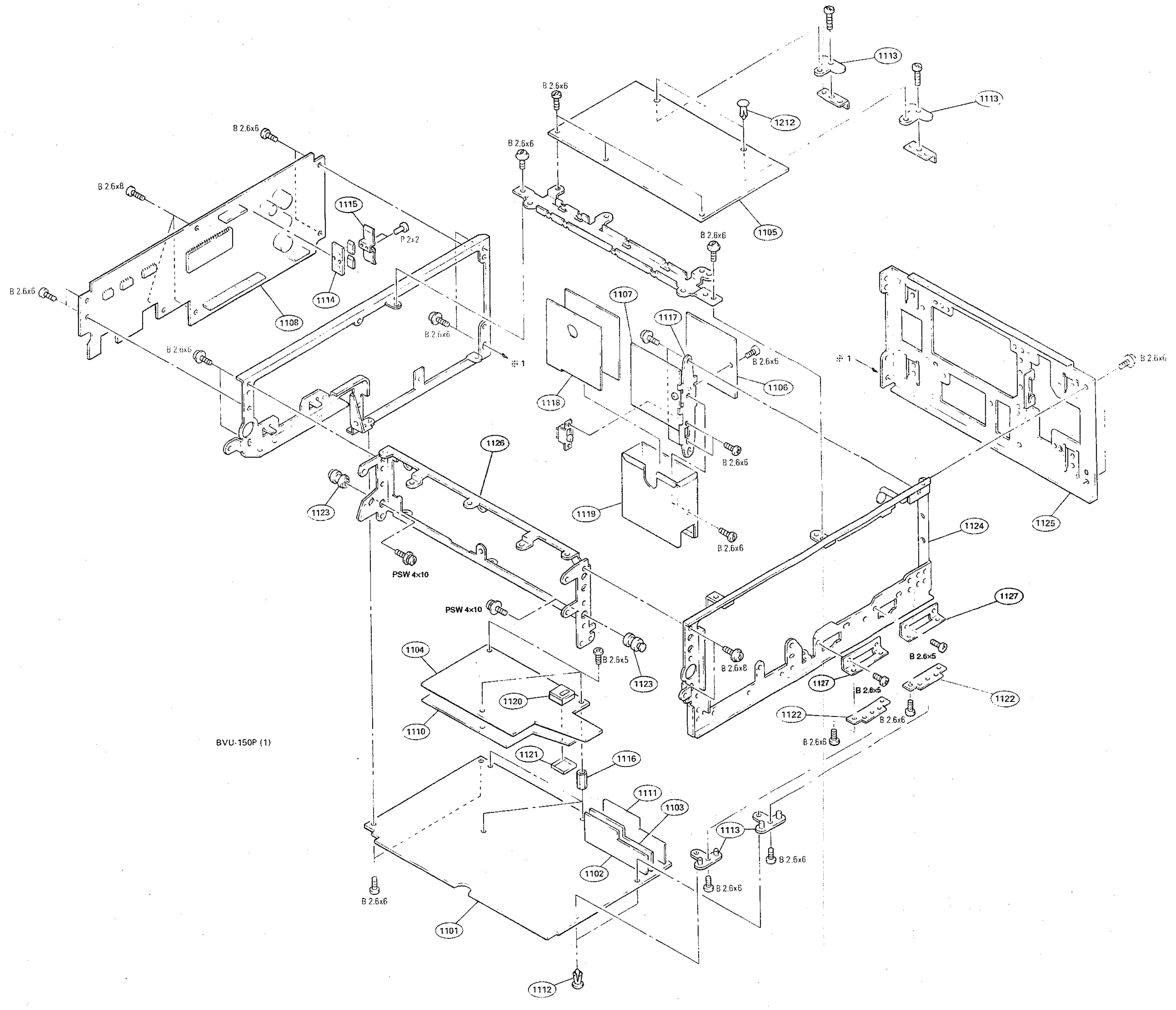
Connector Panel and Audio Board Blocks



BVU-150P (3)
BVU-150 (3)

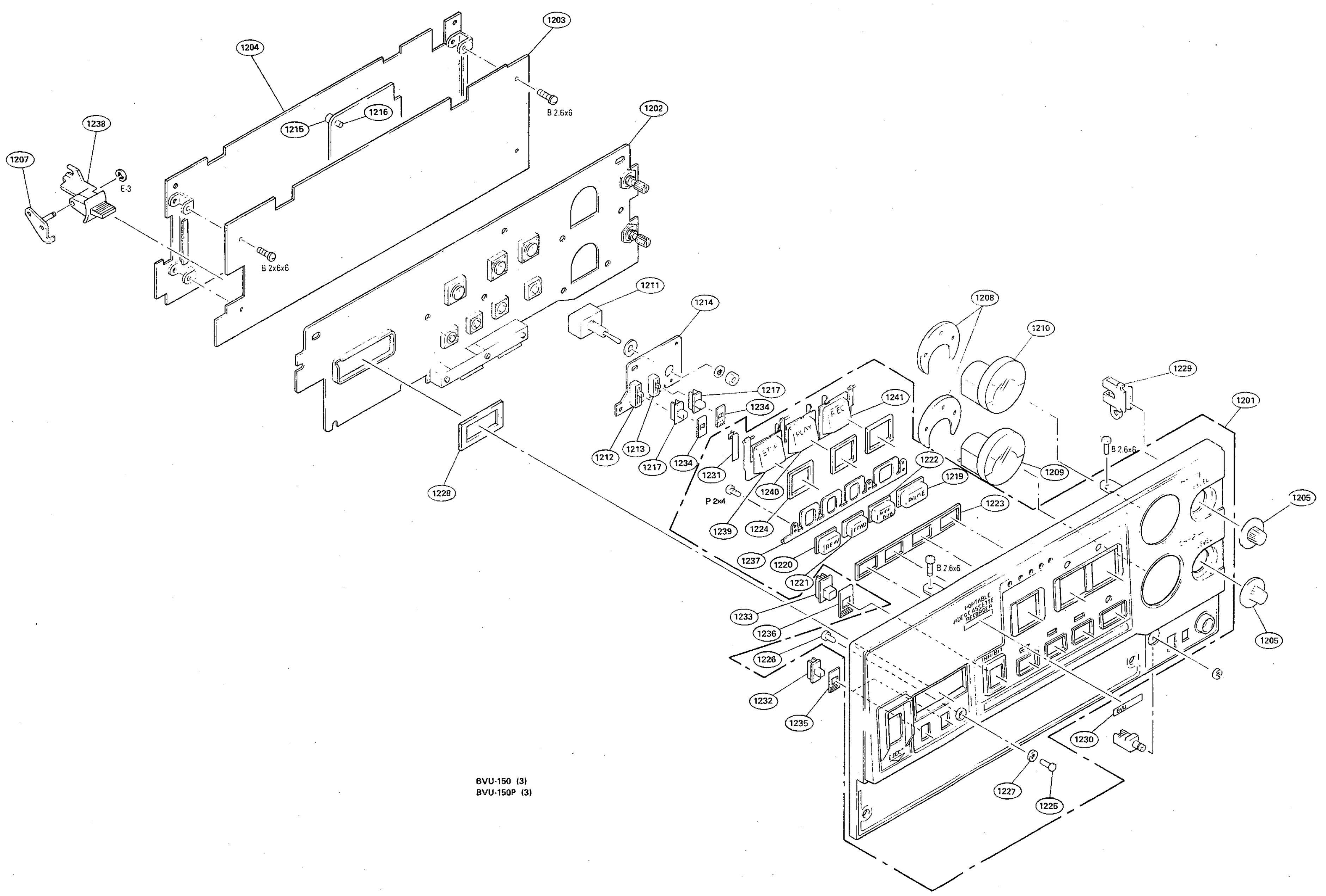
No.	Part No.	SP	Description
1001	A-6713-232-B	o	MOUNTED CIRCUIT BOARD, AU-49A
1002	A-6713-233-A	o	MOUNTED CIRCUIT BOARD, AU-51A
1003	A-6713-234-A	o	MOUNTED CIRCUIT BOARD, CM-19A
1006	1-230-553-11	s	RES, VAR, CARBON 100K
1007	1-237-790-21	s	RES, VAR, CARBON 10K
1008	1-507-195-21	o	SPECIAL REMOTE CONTROL JACK
1009	1-509-176-51	s	RECEPTACLE, 3P MALE
1010	1-509-184-51	s	RECEPTACLE, 3P FEMALE
1011	1-561-040-00	s	RECEPTACLE, 14P FEMALE
1012	1-561-781-21	s	RECEPTACLE, BNC
1013	1-611-965-11	o	PRINTED CIRCUIT BOARD, DUS-6
1014	1-615-689-11	o	PRINTED CIRCUIT BOARD, DUS-69
1015	1-615-977-11	o	PRINTED CIRCUIT BOARD, DUS-70
1016	3-646-090-00	s	RIVET, NYLON
1017	3-682-919-00	o	SPACER (B), XLR
1018	3-694-784-01	o	HINGE
1019	3-687-924-01	o	SHEET, INSULATING, CM
1020	2-380-409-01	o	SPACER, AU PC BOARD
1021	3-694-710-01	o	SPACER, JM-25
1022	3-696-907-01	o	SHEET, INSULATING, L-MOTOR
1023	3-686-023-05	o	PANEL, CONNECTOR
1024	1-561-781-11	s	RECEPTACLE, BNC
1025	3-701-444-21	s	WASHER, 6 (UC: S/N 10001 AND HIGHER) (J: S/N 10001 AND HIGHER) (EK: S/N 10021 AND HIGHER)

Printed Circuit Board and Frame Blocks



No.	Part No.	SP	Description
1101	A-6711-646-A	o	MOUNTED CIRCUIT BOARD, VO-12
1102	A-6711-647-A	o	MOUNTED CIRCUIT BOARD, VA-29
1103	A-6711-648-A	o	MOUNTED CIRCUIT BOARD, BF-12
1104	A-6711-649-A	o	MOUNTED CIRCUIT BOARD, CR-26
1105	A-6711-651-A	o	MOUNTED CIRCUIT BOARD, YC-20
1106	A-6713-230-A	o	MOUNTED CIRCUIT BOARD, AU-64
1107	A-6713-231-A	o	MOUNTED CIRCUIT BOARD, AU-65
1108	A-6715-265-B	o	MOUNTED CIRCUIT BOARD, SV-57C
1110	X-3694-706-1	o	SHIELD ASSY, CR LOWER
1111	X-3694-708-1	o	PLATE ASSY, SHIELD, BF
1112	3-646-090-00	s	RIVET, NYLON
1113	3-657-153-00	o	HINGE
1114	3-686-055-01	o	HEAT SINK
1115	3-686-056-01	o	SPRING, LEAF
1116	3-694-708-01	o	SPACER, PC BOARD
1117	3-694-723-01	o	SPACER, NR
1118	3-694-731-03	o	SHEET, INSULATING, NR
1119	3-694-733-01	o	CASE, NR
1120	3-694-759-01	o	LID, CR SHIELD
1121	3-694-762-01	o	LID, REAR, CR SHIELD
1122	3-694-772-01	o	HOLDER, VO
1123	3-694-773-01	o	SUSPENSION (B)
1124	3-694-775-02	o	FRAME (B), R
1125	3-694-776-01	o	FRAME (B), REAR
1126	3-694-727-01	o	FRAME (B), F
1127	3-694-774-01	o	BRACKET, VO

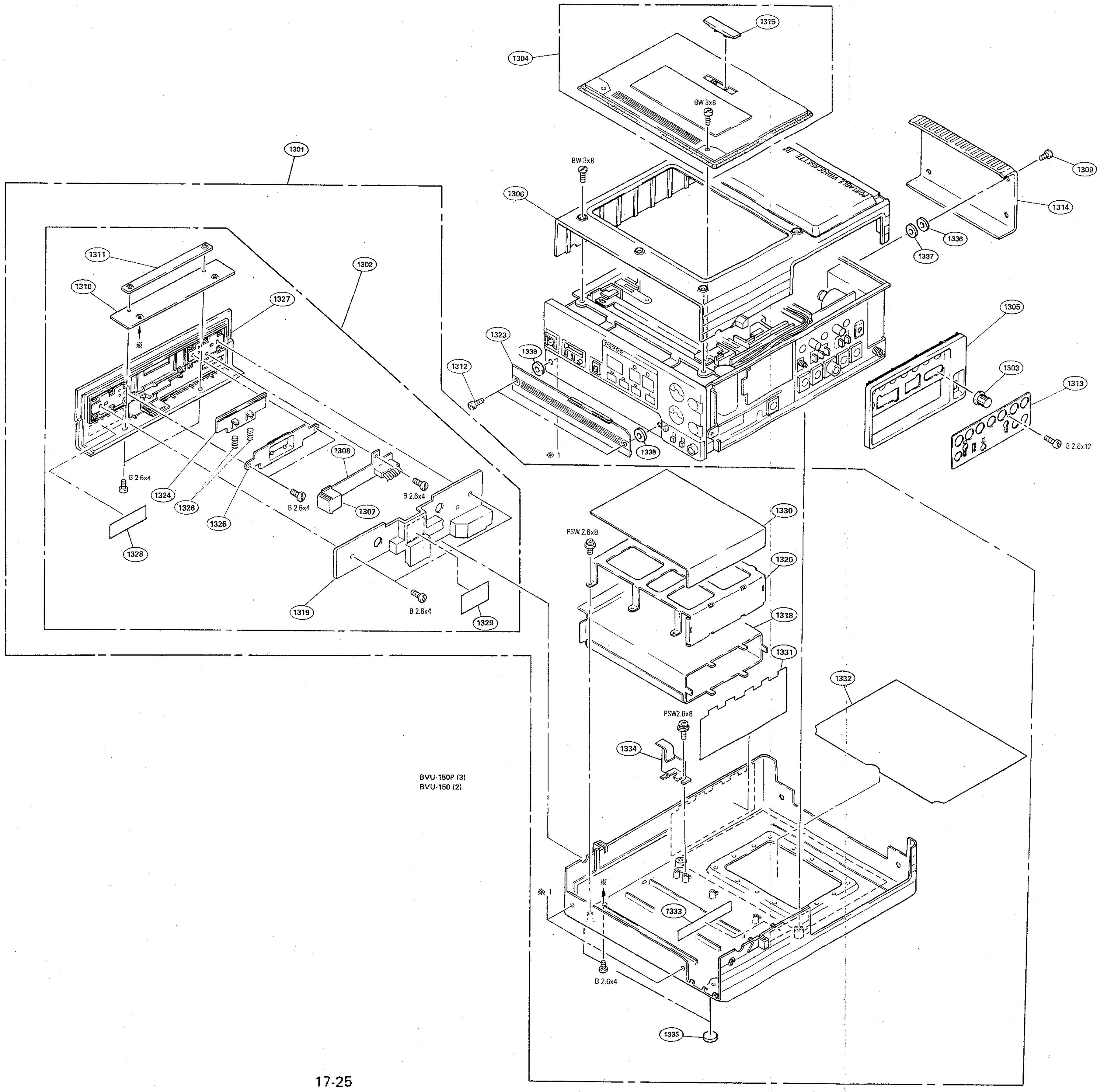
Front Panel and Function Key Blocks



BVU-150 (3)
BVU-150P (3)

No.	Part No.	SP	Description
1201	A-6704-186-C	o	PANEL SUB ASSY, FRONT
1202	A-6717-404-A	o	MOUNTED CIRCUIT BOARD, KY-86
1203	A-6717-405-A	o	MOUNTED CIRCUIT BOARD, SY-18C
1204	A-6717-406-A	o	MOUNTED CIRCUIT BOARD, SY-22A
1205	X-3694-702-1	s	KNOB (A) ASSY, VOL
1207	X-3694-704-1	o	HOLDER ASSY, E LEVER
1208	X-3694-705-1	o	CUSHION ASSY, METER
1209	1-520-482-11	s	METER, LEVER
1210	1-520-482-21	s	METER, LEVER
1211	1-553-246-00	s	SWITCH TOGGLE
1212	1-570-851-11	s	SWITCH, SLIDE
1213	1-570-857-11	s	SWITCH, SLIDE
1214	1-615-967-11	o	PRINTED CIRCUIT BOARD, SWB-4
1215	3-659-487-00	s	HOLDER, BUZZER
1216	3-659-488-00	s	PIN, BUZZER HOLDER
1217	3-686-042-02	s	LEVER (C), SW
1219	3-698-909-01	s	KEY TOP, D "PAUSE"
1220	3-686-077-11	s	KEY TOP, (A) "REW"
1221	3-686-077-21	s	KEY TOP, (B) "FFWD"
1222	3-686-077-31	s	KEY TOP, (C) "AUDIO DUB"
1223	3-686-082-01	o	SPACER (B)
1224	3-686-083-01	o	SPACER (A)
1225	3-686-084-01	s	PUSH BUTTON
1226	3-686-085-01	s	PIN, PUSH BUTTON
1227	3-686-086-01	s	CUSHION, BUTTON
1228	3-687-929-01	o	COVER, DUST, COUNTER
1229	3-687-930-01	o	PLATE, GROUND, RJ
1230	3-687-931-31	o	LABLE, F PANEL
1231	3-694-739-01	o	SPRING
1232	3-694-740-02	o	LEVER (E), SW
1233	3-694-742-02	o	LEVER (I), SLIDE
1234	3-694-743-01	o	PLATE (C), ORNAMENTAL, KNOB
1235	3-694-744-01	o	PLATE (D), ORNAMENTAL, KNOB
1236	3-694-746-01	o	PLATE, ORNAMENTAL
1237	3-694-748-01	o	SPRING
1238	3-694-756-01	o	BUTTON, E
1239	3-694-781-01	s	BUTTON, (A) "STOP"
1240	3-694-781-11	s	BUTTON, (A) "PLAY"
1241	3-694-782-01	s	BUTTON, (B) "REC"

Ornamental Panel Block



No.	Part No.	SP	Description
1301	A-6703-551-B	o	CABINET (LOWER) ASSY
1302	A-6703-552-B	o	LID ASSY, BATTERY
1303	X-3685-857-1	s	KNOB ASSY, CP
1304	X-3694-701-1	s	COVER ASSY, C
1305	X-3694-707-1	o	ESCUTCHEON ASSY, CP
1306	X-3694-709-3	o	CABINET ASSY, UPPER
1307	1-507-626-00	s	JACK, POWER OUTSIDE
1308	1-615-976-11	o	PRINTED CIRCUIT BOARD, CN-26
1309	2-382-129-11	s	SCREW (M3×8), BW (UC: S/N UP TO 12565) (J: S/N UP TO 10420) (EK: S/N UP TO 14900)
	3-719-159-01	s	SCREW (M3), (+BW) (UC: S/N 12566 AND HIGHER) (J: S/N 10421 AND HIGHER) (EK: S/N 14901 AND HIGHER)
1310	3-662-718-00	o	HINGE
1311	3-662-719-00	o	NUT, HINGE FITTING
1312	3-676-089-71	s	SCREW (4×13), LID
1313	3-694-712-01	o	PLATE, ORNAMENTAL, CP
1314	3-694-716-02	o	PANEL, REAR
1315	3-694-718-01	o	EMBLEM, U MATIC SP
1318	3-694-725-01	o	CASE, BATTERY
1319	3-694-726-03	o	COVER, B LID
1320	3-694-728-01	o	HOLDER, B CASE
1323	3-694-750-01	o	COVER (A), BK
1324	3-694-779-03	o	LEVER, BATTERY LOCK
1325	3-694-780-02	o	HOLDER, B LEVER
1326	3-849-356-00	s	SPRING, COIL
1327	X-3694-710-6	o	LID SUB ASSY, BATTERY
1328	3-678-782-00	o	LABEL, DOLBY (C)
1329	3-694-796-01	o	PLATE, INDICATION, BATTERY
1330	3-694-799-01	o	INSULATOR (BA)
1331	3-698-901-01	o	INSULATOR (LEFT)
1332	3-698-902-01	o	INSULATOR (LOWER)
1333	3-698-903-01	o	INSULATOR (RIGHT LOWER)
1334	3-698-904-01	o	PASS, HARNESS
1335	2-246-108-00	s	CUSHION
1336	3-694-791-01	o	SPACER
1337	3-694-792-01	o	WASHER
1338	3-650-537-00	o	WASHER

17-3. ELECTRICAL PARTS LIST

AU-49A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6713-232-B	o	MOUNTED CIRCUIT BOARD, AU-49A
3pcs	1-535-366-21	o	CONTACT
1pc	1-561-727-11	o	HOUSING, CONNECTOR 4P
2pcs	1-562-147-11	o	HOUSING, CONNECTOR 2P
3pcs	1-562-148-11	o	HOUSING, CONNECTOR 3P
1pc	1-562-152-31	o	HOUSING, CONNECTOR 7P
4pcs	1-562-153-11	o	HOUSING, CONNECTOR 8P
1pc	1-562-154-11	o	HOUSING, CONNECTOR 9P
2pcs	1-562-731-11	o	CONNECTOR, MULTI 40P
3pcs	4-352-844-01	o	PIN, LEAD, COATING
2pcs	2-380-409-00	o	SPACER, DIN CONNECTOR
2pcs	7-628-253-95	s	SCREW +PS 2.6×4
#C1	1-130-483-00	s	FILM 0.01uF 5% 50V
C101	1-109-630-00	s	MICA 270PF 1% 500V
C102	1-124-910-11	s	ELECT 47uF 20% 16V
C103	1-163-125-00	s	CERAMIC 220PF 5% 50V
C105	1-130-487-00	s	MYLAR 0.022uF 5% 50V
C106	1-124-584-00	s	ELECT 100uF 20% 6.3V
C107	1-163-017-00	s	CERAMIC 0.0047uF 10% 50V
C108	1-126-157-11	s	ELECT 10uF 20% 16V
C109	1-126-157-11	s	ELECT 10uF 20% 16V
C110	1-124-584-00	s	ELECT 100uF 20% 6.3V
C111	1-126-154-11	s	ELECT 47uF 20% 6.3V
C112	1-126-153-11	s	ELECT 22uF 20% 6.3V
C113	1-131-351-00	s	TANTALUM 4.7uF 10% 35V
C115	1-126-157-11	s	ELECT 10uF 20% 16V
C116	1-124-234-00	s	ELECT 22uF 20% 16V
#C117	1-124-230-00	s	ELECT 10uF 20% 16V
#C118	1-130-494-11	s	MYLAR 0.082uF 5% 50V
C119	1-126-157-11	s	ELECT 10uF 20% 16V
C120	1-102-116-00	s	CERAMIC 680PF 10% 50V
C121	1-126-157-11	s	ELECT 10uF 20% 16V
C123	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V
C124	1-126-157-11	s	ELECT 10uF 20% 16V
C125	1-124-120-11	s	ELECT 220uF 20% 16V
C126	1-126-157-11	s	ELECT 10uF 20% 16V
C127	1-126-157-11	s	ELECT 10uF 20% 16V
C128	1-163-125-00	s	CERAMIC 220PF 5% 50V
C129	1-124-120-11	s	ELECT 220uF 20% 16V
C131	1-124-234-00	s	ELECT 22uF 20% 16V
C132	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C135	1-163-125-00	s	CERAMIC 220PF 5% 50V
C150	1-163-251-11	s	CERAMIC 100PF 5% 50V
C160	1-163-235-11	s	CERAMIC 22PF 5% 50V
C161	1-163-235-11	s	CERAMIC 22PF 5% 50V
C201	1-109-630-00	s	MICA 270PF 1% 500V
C202	1-124-910-11	s	ELECT 47uF 20% 16V
C203	1-163-125-00	s	CERAMIC 220PF 5% 50V
#C204	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C205	1-130-487-00	s	MYLAR 0.022uF 5% 50V
C206	1-124-584-00	s	ELECT 100uF 20% 6.3V
C207	1-163-017-00	s	CERAMIC 0.0047uF 10% 50V
C208	1-126-157-11	s	ELECT 10uF 20% 16V
C209	1-126-157-11	s	ELECT 10uF 20% 16V
C210	1-124-584-00	s	ELECT 100uF 20% 6.3V
C211	1-126-154-11	s	ELECT 47uF 20% 6.3V

(AU-49A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C212	1-126-153-11	s	ELECT 22uF 20% 6.3V
C213	1-131-351-00	s	TANTALUM 4.7uF 10% 35V
C215	1-126-157-11	s	ELECT 10uF 20% 16V
C216	1-124-234-00	s	ELECT 22uF 20% 16V
#C217	1-124-230-00	s	ELECT 10uF 20% 16V
C218	1-130-494-11	s	MYLAR 0.082uF 5% 50V
C219	1-126-157-11	s	ELECT 10uF 20% 16V
C220	1-102-116-00	s	CERAMIC 680PF 10% 50V
C221	1-126-157-11	s	ELECT 10uF 20% 16V
C223	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V
C224	1-126-157-11	s	ELECT 10uF 20% 16V
C225	1-124-120-11	s	ELECT 220uF 20% 16V
C226	1-126-157-11	s	ELECT 10uF 20% 16V
C227	1-126-157-11	s	ELECT 10uF 20% 16V
C228	1-163-125-00	s	CERAMIC 220PF 5% 50V
C229	1-124-120-11	s	ELECT 220uF 20% 16V
C231	1-124-234-00	s	ELECT 22uF 20% 16V
C235	1-163-125-00	s	CERAMIC 220PF 5% 50V
C240	1-130-487-00	s	MYLAR 0.022uF 5% 50V
C250	1-163-251-11	s	CERAMIC 100PF 5% 50V
C260	1-163-235-11	s	CERAMIC 22PF 5% 50V
C261	1-163-235-11	s	CERAMIC 22PF 5% 50V
C301	1-126-101-11	s	ELECT 100uF 20% 16V
C302	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C304	1-126-157-11	s	ELECT 10uF 20% 16V
C305	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C306	1-126-157-11	s	ELECT 10uF 20% 16V
C307	1-124-257-00	s	ELECT 2.2uF 20% 35V
C308	1-126-160-11	s	ELECT 1uF 20% 50V
C309	1-126-157-11	s	ELECT 10uF 20% 16V
C310	1-126-154-11	s	ELECT 47uF 20% 6.3V
C311	1-126-157-11	s	ELECT 10uF 20% 16V
C312	1-126-154-11	s	ELECT 47uF 20% 6.3V
C313	1-126-157-11	s	ELECT 10uF 20% 16V
C315	1-126-160-11	s	ELECT 1uF 20% 50V
C316	1-126-101-11	s	ELECT 100uF 20% 16V
C317	1-131-349-00	s	TANTALUM 2.2uF 10% 16V
C318	1-126-154-11	s	ELECT 47uF 20% 6.3V
C319	1-124-584-00	s	ELECT 100uF 20% 6.3V
C320	1-124-589-11	s	ELECT 47uF 20% 16V
C321	1-126-154-11	s	ELECT 47uF 20% 6.3V
C322	1-124-443-00	s	ELECT 100uF 20% 6.3V
C323	1-124-584-00	s	ELECT 100uF 20% 6.3V
C324	1-124-589-11	s	ELECT 47uF 20% 16V
C325	1-163-035-00	s	CERAMIC 0.047uF 50V
C326	1-163-035-00	s	CERAMIC 0.047uF 50V
C330	1-163-035-00	s	CERAMIC 0.047uF 50V
C333	1-124-229-00	s	ELECT 33uF 20% 6.3V
C334	1-131-365-00	s	TANTALUM 10uF 10% 16V
C335	1-130-472-00	s	MYLAR 0.0012uF 5% 50V
CN401	1-506-485-11	o	PIN, CONNECTOR 6P
CN404	1-506-468-11	s	PIN, CONNECTOR 3P
CN405	1-506-469-11	s	PIN, CONNECTOR 4P
CN406	1-564-005-11	o	PIN, CONNECTOR 6P
CN409	1-506-468-11	s	PIN, CONNECTOR 3P

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(AU-49A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
CN410	1-506-481-11	s	PIN, CONNECTOR 2P
CN411	1-506-468-11	s	PIN, CONNECTOR 3P
CN412	1-564-004-11	o	PIN, CONNECTOR 5P
CN413	1-506-481-11	s	PIN, CONNECTOR 2P
CN414	1-506-468-11	s	PIN, CONNECTOR 3P
CN415	1-506-468-11	s	PIN, CONNECTOR 3P
CN416	1-506-468-11	s	PIN, CONNECTOR 3P
CN417	1-506-468-11	s	PIN, CONNECTOR 3P
CN418	1-506-468-11	s	PIN, CONNECTOR 3P
CN422	1-564-002-41	s	PIN, CONNECTOR 3P
CN450	1-564-002-41	s	PIN, CONNECTOR 3P
CN451	1-564-007-11	o	PIN, CONNECTOR 8P
CN452	1-506-472-11	s	PIN, CONNECTOR 7P
D101	8-719-400-18	s	DIODE MA152WK
D104	8-719-400-18	s	DIODE MA152WK
D105	8-719-800-76	s	DIODE 1SS226
D201	8-719-400-18	s	DIODE MA152WK
D301	8-719-110-13	s	DIODE RD9.1ES-B2
D302	8-719-109-85	s	DIODE RD5.1ES-B2
D303	8-719-800-76	s	DIODE 1SS226
D304	8-719-911-19	s	DIODE 1SS119
D308	8-719-400-18	s	DIODE MA152WK
D309	8-719-911-19	s	DIODE 1SS119
D310	8-719-911-19	s	DIODE 1SS119
D312	8-719-911-19	s	DIODE 1SS119
D320	8-719-911-19	s	DIODE 1SS119
D323	8-719-104-34	s	DIODE 1S2836
#D324	8-719-400-18	s	DIODE MA152WK
FL1	8-741-134-32	s	IC BX-1343A(SONY)
FL2	8-741-134-32	s	IC BX-1343A(SONY)
IC101	8-759-981-58	s	IC RC2043MD(RAYTHEON)
IC102	8-759-300-71	s	IC HD14053BFP(HITACHI)
IC103	8-759-981-54	s	IC RC2041MD(RAYTHEON)
IC104	8-759-981-54	s	IC RC2041MD(RAYTHEON)
IC105	8-759-905-42	s	IC NE5534P(TI)
IC106	8-759-905-42	s	IC NE5534P(TI)
IC202	8-759-300-71	s	IC HD14053BFP(HITACHI)
IC203	8-759-981-54	s	IC RC2041MD(RAYTHEON)
IC204	8-759-981-54	s	IC RC2041MD(RAYTHEON)
IC205	8-759-905-42	s	IC NE5534P(TI)
IC206	8-759-905-42	s	IC NE5534P(TI)
IC301	8-759-981-99	s	IC NJM4560M(JRC)
LV101	1-459-411-00	s	COIL, VARIABLE 18mH
LV102	1-459-434-00	s	COIL, VARIABLE 22mH
LV103	1-459-411-00	s	COIL, VARIABLE 18mH
LV201	1-459-411-00	s	COIL, VARIABLE 18mH
LV202	1-459-434-00	s	COIL, VARIABLE 22mH
LV203	1-459-411-00	s	COIL, VARIABLE 18mH
LV204	1-459-434-00	s	COIL, VARIABLE 22mH
Q101	8-729-178-55	s	TRANSISTOR 2SC2785-E
Q102	8-729-178-55	s	TRANSISTOR 2SC2785-E
Q103	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q104	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
#Q105	8-729-901-01	s	DTC144ER

(AU-49A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q106	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q107	8-729-901-01	s	TRANSISTOR DTC144EK-T146
Q108	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q110	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q111	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q112	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q113	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q114	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q115	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q116	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q120	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q123	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q133	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q136	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q201	8-729-178-55	s	TRANSISTOR 2SC2785-E
Q202	8-729-178-55	s	TRANSISTOR 2SC2785-E
Q203	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q204	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
#Q205	8-729-901-01	s	DTC144ER
Q206	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q207	8-729-901-01	s	TRANSISTOR DTC144EK
Q208	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q210	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q211	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q212	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q213	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q214	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q215	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q216	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q217	8-729-901-01	s	TRANSISTOR DTC144EK
Q220	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q223	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q224	8-729-901-01	s	TRANSISTOR DTC144EK
Q225	8-729-901-06	s	TRANSISTOR DTA144EK
Q233	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q236	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q302	8-729-905-53	s	TRANSISTOR 2SD1055-R
Q303	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q304	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q305	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q306	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q307	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q308	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
#Q310	8-729-901-01	s	TRANSISTOR DTC144EK
Q311	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q312	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q313	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q314	8-729-216-22	s	TRANSISTOR 2SA812-T1M5
Q315	8-729-216-22	s	TRANSISTOR 2SA812-T1M5
Q316	8-729-205-95	s	TRANSISTOR 2SA1428-Y
Q317	8-729-905-53	s	TRANSISTOR 2SD1055-R
#Q318	8-729-901-01	s	TRANSISTOR DTC144EK
Q325	8-729-901-01	s	TRANSISTOR DTC144EK
Q326	8-729-901-01	s	TRANSISTOR DTC144EK
Q327	8-729-901-01	s	TRANSISTOR DTC144EK
Q328	8-729-901-01	s	TRANSISTOR DTC144EK
Q330	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6

Note:For the # marked in the followig parts list refer to Section 18 "CHANGED PARTS"

(AU-49A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R1	1-247-807-31	s	CARBON 100 5% 1/4W
R101	1-216-073-00	s	METAL 10K 5% 1/10W
R102	1-216-073-00	s	METAL 10K 5% 1/10W
R103	1-216-001-00	s	METAL 10 5% 1/10W
R104	1-216-065-00	s	METAL 4.7K 5% 1/10W
R105	1-216-089-91	s	METAL 47K 5% 1/10W
R107	1-216-029-00	s	METAL 150 5% 1/10W
R108	1-216-065-00	s	METAL 4.7K 5% 1/10W
R109	1-216-057-00	s	METAL 2.2K 5% 1/10W
R110	1-216-033-00	s	METAL 220 5% 1/10W
R111	1-216-049-00	s	METAL 1K 5% 1/10W
#R112	1-215-475-00	s	METAL 180K 1% 1/4W
R113	1-216-025-00	s	METAL 100 5% 1/10W
R114	1-216-073-00	s	METAL 10K 5% 1/10W
R115	1-216-097-00	s	METAL 100K 5% 1/10W
R116	1-216-097-00	s	METAL 100K 5% 1/10W
R117	1-216-049-00	s	METAL 1K 5% 1/10W
R118	1-216-049-00	s	METAL 1K 5% 1/10W
R119	1-216-105-00	s	METAL 220K 5% 1/10W
R120	1-216-025-00	s	METAL 100 5% 1/10W
R122	1-216-295-00	s	METAL 0 5% 1/10W
R123	1-216-073-00	s	METAL 10K 5% 1/10W
R124	1-216-097-00	s	METAL 100K 5% 1/10W
R125	1-216-041-00	s	METAL 470 5% 1/10W
R126	1-216-097-00	s	METAL 100K 5% 1/10W
R128	1-216-089-91	s	METAL 47K 5% 1/10W
R129	1-216-089-91	s	METAL 47K 5% 1/10W
R130	1-216-089-91	s	METAL 47K 5% 1/10W
R131	1-216-295-00	s	METAL 0 5% 1/10W
R132	1-216-073-00	s	METAL 10K 5% 1/10W
R133	1-216-073-00	s	METAL 10K 5% 1/10W
R134	1-216-017-00	s	METAL 47 5% 1/10W
R135	1-216-043-00	s	METAL 560 5% 1/10W
R136	1-216-085-00	s	METAL 33K 5% 1/10W
R137	1-216-045-00	s	METAL 680 5% 1/10W
#R138	1-216-037-00	s	METAL 10K 5% 1/10W
#R140	1-216-295-00	s	METAL 0 5% 1/10W
R141	1-216-049-00	s	METAL 1K 5% 1/10W
#R142	1-216-678-11	s	METAL 13K 0.50% 1/10W
R143	1-216-065-00	s	METAL 4.7K 5% 1/10W
R144	1-216-065-00	s	METAL 4.7K 5% 1/10W
R145	1-216-073-00	s	METAL 10K 5% 1/10W
R146	1-216-093-00	s	METAL 68K 5% 1/10W
R147	1-216-101-00	s	METAL 150K 5% 1/10W
R148	1-216-075-00	s	METAL 12K 5% 1/10W
R151	1-216-017-00	s	METAL 47 5% 1/10W
R153	1-216-065-00	s	METAL 4.7K 5% 1/10W
R155	1-215-433-00	s	METAL 3.3K 1% 1/4W
R156	1-215-433-00	s	METAL 3.3K 1% 1/4W
R157	1-216-073-00	s	METAL 10K 5% 1/10W
R158	1-216-045-00	s	METAL 680 5% 1/10W
R160	1-216-067-00	s	METAL 5.6K 5% 1/10W
R161	1-215-445-00	s	METAL 10K 1% 1/4W
R165	1-215-389-00	s	METAL 47 1% 1/4W
R166	1-216-067-00	s	METAL 5.6K 5% 1/10W

(AU-49A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R167	1-215-445-00	s	METAL 10K 1% 1/4W
R168	1-216-089-91	s	METAL 47K 5% 1/10W
R169	1-216-073-00	s	METAL 10K 5% 1/10W
R170	1-215-433-00	s	METAL 3.3K 1% 1/4W
R171	1-215-433-00	s	METAL 3.3K 1% 1/4W
R172	1-216-049-00	s	METAL 1K 5% 1/10W
R173	1-215-445-00	s	METAL 10K 1% 1/4W
R176	1-215-445-00	s	METAL 10K 1% 1/4W
R180	1-215-389-00	s	METAL 47 1% 1/4W
R181	1-216-067-00	s	METAL 5.6K 5% 1/10W
R182	1-215-445-00	s	METAL 10K 1% 1/4W
R183	1-216-101-00	s	METAL 150K 5% 1/10W
R184	1-216-067-00	s	METAL 5.6K 5% 1/10W
R185	1-216-105-00	s	METAL 220K 5% 1/10W
R188	1-216-037-00	s	METAL 330 5% 1/10W
R189	1-216-045-00	s	METAL 680 5% 1/10W
R192	1-216-067-00	s	METAL 5.6K 5% 1/10W
R201	1-216-073-00	s	METAL 10K 5% 1/10W
R202	1-216-073-00	s	METAL 10K 5% 1/10W
R203	1-216-001-00	s	METAL 10 5% 1/10W
R204	1-216-065-00	s	METAL 4.7K 5% 1/10W
R205	1-216-089-91	s	METAL 47K 5% 1/10W
R206	1-216-073-00	s	METAL 10K 5% 1/10W
R207	1-216-029-00	s	METAL 150 5% 1/10W
R208	1-216-065-00	s	METAL 4.7K 5% 1/10W
R209	1-216-057-00	s	METAL 2.2K 5% 1/10W
R210	1-216-033-00	s	METAL 220 5% 1/10W
R211	1-216-049-00	s	METAL 1K 5% 1/10W
#R212	1-215-475-00	s	METAL 180K 1% 1/4W
R213	1-216-025-00	s	METAL 100 5% 1/10W
R216	1-216-097-00	s	METAL 100K 5% 1/10W
R217	1-216-049-00	s	METAL 1K 5% 1/10W
R218	1-216-049-00	s	METAL 1K 5% 1/10W
R219	1-216-105-00	s	METAL 220K 5% 1/10W
R220	1-216-025-00	s	METAL 100 5% 1/10W
R222	1-216-295-00	s	METAL 0 5% 1/10W
R223	1-216-073-00	s	METAL 10K 5% 1/10W
R224	1-216-097-00	s	METAL 100K 5% 1/10W
R225	1-216-041-00	s	METAL 470 5% 1/10W
R226	1-216-097-00	s	METAL 100K 5% 1/10W
R228	1-216-089-91	s	METAL 47K 5% 1/10W
R229	1-216-089-91	s	METAL 47K 5% 1/10W
R230	1-216-089-91	s	METAL 47K 5% 1/10W
R231	1-216-295-00	s	METAL 0 5% 1/10W
R232	1-216-073-00	s	METAL 10K 5% 1/10W
R233	1-216-073-00	s	METAL 10K 5% 1/10W
R234	1-216-017-00	s	METAL 47 5% 1/10W
R235	1-216-043-00	s	METAL 560 5% 1/10W
R236	1-216-085-00	s	METAL 33K 5% 1/10W
R237	1-216-045-00	s	METAL 680 5% 1/10W
R238	1-216-065-00	s	METAL 4.7K 5% 1/10W
#R239	1-216-037-00	s	METAL 10K 5% 1/10W
#R240	1-216-295-00	s	METAL 0 5% 1/10W
R241	1-216-049-00	s	METAL 1K 5% 1/10W
#R242	1-216-678-11	s	METAL 13K 0.50% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(AU-49A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R243	1-216-065-00	s	METAL 4.7K 5% 1/10W
R244	1-216-065-00	s	METAL 4.7K 5% 1/10W
R245	1-216-073-00	s	METAL 10K 5% 1/10W
R246	1-216-093-00	s	METAL 68K 5% 1/10W
R247	1-216-101-00	s	METAL 150K 5% 1/10W
R248	1-216-075-00	s	METAL 12K 5% 1/10W
R251	1-216-017-00	s	METAL 47 5% 1/10W
R253	1-216-065-00	s	METAL 4.7K 5% 1/10W
R254	1-216-065-00	s	METAL 4.7K 5% 1/10W
R255	1-215-433-00	s	METAL 3.3K 1% 1/4W
R256	1-215-433-00	s	METAL 3.3K 1% 1/4W
R257	1-216-073-00	s	METAL 10K 5% 1/10W
R258	1-216-045-00	s	METAL 680 5% 1/10W
R260	1-216-067-00	s	METAL 5.6K 5% 1/10W
R261	1-215-445-00	s	METAL 10K 1% 1/4W
R265	1-215-389-00	s	METAL 47 1% 1/4W
R266	1-216-067-00	s	METAL 5.6K 5% 1/10W
R267	1-215-445-00	s	METAL 10K 1% 1/4W
R268	1-216-089-91	s	METAL 47K 5% 1/10W
R269	1-216-073-00	s	METAL 10K 5% 1/10W
R270	1-215-433-00	s	METAL 3.3K 1% 1/4W
R271	1-215-433-00	s	METAL 3.3K 1% 1/4W
R272	1-216-049-00	s	METAL 1K 5% 1/10W
R273	1-215-445-00	s	METAL 10K 1% 1/4W
R276	1-215-445-00	s	METAL 10K 1% 1/4W
R280	1-215-389-00	s	METAL 47 1% 1/4W
R281	1-216-067-00	s	METAL 5.6K 5% 1/10W
R282	1-215-445-00	s	METAL 10K 1% 1/4W
R285	1-216-105-00	s	METAL 220K 5% 1/10W
R288	1-216-037-00	s	METAL 330 5% 1/10W
R292	1-216-067-00	s	METAL 5.6K 5% 1/10W
#R301	1-216-065-00	s	METAL 4.7K 5% 1/10W
R302	1-216-057-00	s	METAL 2.2K 5% 1/10W
R303	1-216-073-00	s	METAL 10K 5% 1/10W
R304	1-216-073-00	s	METAL 10K 5% 1/10W
R305	1-216-073-00	s	METAL 10K 5% 1/10W
R306	1-216-073-00	s	METAL 10K 5% 1/10W
R307	1-216-073-00	s	METAL 10K 5% 1/10W
R308	1-216-083-00	s	METAL 27K 5% 1/10W
R309	1-216-073-00	s	METAL 10K 5% 1/10W
R310	1-216-061-00	s	METAL 3.3K 5% 1/10W
R311	1-216-065-00	s	METAL 4.7K 5% 1/10W
R312	1-216-009-00	s	METAL 22 5% 1/10W
R313	1-216-009-00	s	METAL 22 5% 1/10W
R314	1-216-059-00	s	METAL 2.7K 5% 1/10W
R315	1-216-065-00	s	METAL 4.7K 5% 1/10W
R316	1-216-029-00	s	METAL 150 5% 1/10W
R317	1-216-073-00	s	METAL 10K 5% 1/10W
R318	1-216-049-00	s	METAL 1K 5% 1/10W
R319	1-216-065-00	s	METAL 4.7K 5% 1/10W
R320	1-216-073-00	s	METAL 10K 5% 1/10W
R321	1-216-073-00	s	METAL 10K 5% 1/10W
R322	1-216-097-00	s	METAL 100K 5% 1/10W
R323	1-216-065-00	s	METAL 4.7K 5% 1/10W
R324	1-216-073-00	s	METAL 10K 5% 1/10W

(AU-49A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R325	1-216-089-91	s	METAL 47K 5% 1/10W
R326	1-216-073-00	s	METAL 10K 5% 1/10W
R327	1-216-069-00	s	METAL 6.8K 5% 1/10W
R328	1-216-065-00	s	METAL 4.7K 5% 1/10W
R329	1-216-073-00	s	METAL 10K 5% 1/10W
R330	1-216-089-91	s	METAL 47K 5% 1/10W
R331	1-216-069-00	s	METAL 6.8K 5% 1/10W
R332	1-216-065-00	s	METAL 4.7K 5% 1/10W
#R333	1-216-065-00	s	METAL 4.7K 5% 1/10W
R337	1-216-073-00	s	METAL 10K 5% 1/10W
R338	1-216-073-00	s	METAL 10K 5% 1/10W
R339	1-216-073-00	s	METAL 10K 5% 1/10W
R340	1-216-089-91	s	METAL 47K 5% 1/10W
R341	1-216-073-00	s	METAL 10K 5% 1/10W
R342	1-216-025-00	s	METAL 100 5% 1/10W
R343	1-216-049-00	s	METAL 1K 5% 1/10W
R344	1-216-043-00	s	METAL 560 5% 1/10W
R345	1-216-073-00	s	METAL 10K 5% 1/10W
R355	1-216-029-00	s	METAL 150 5% 1/10W
R360	1-216-073-00	s	METAL 10K 5% 1/10W
R361	1-216-081-00	s	METAL 22K 5% 1/10W
R362	1-216-121-00	s	METAL 1M 5% 1/10W
#R363	1-216-053-00	s	METAL 1.5K 5% 1/10W
R366	1-216-295-00	s	METAL 0 5% 1/10W
#R367	1-216-029-00	s	METAL 150 5% 1/10W
#R368	1-247-847-31	s	CARBON 4.7K 5% 1/4W
#R369	1-247-847-31	s	CARBON 4.7K 5% 1/4W
#RV102	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV103	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV104	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
RV105	1-228-461-00	s	RES, ADJ, CERMET 50K
#RV106	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV107	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV108	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV201	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV202	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV203	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV204	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
RV205	1-228-461-00	s	RES, ADJ, CERMET 50K
#RV206	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV207	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV208	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV302	1-228-394-00	s	RES, ADJ, METAL GLAZE 4.7K
#RV303	1-228-394-00	s	RES, ADJ, METAL GLAZE 4.7K

AU-51A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6713-233-A	o	MOUNTED CIRCUIT BOARD, AU-51A
1pc	1-611-961-11	o	PRINTED CIRCUIT BOARD, DUS-3

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(AU-51A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
#C1	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C101	1-131-375-00	s	TANTALUM 4.7uF 20% 10V
C102	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C103	1-131-419-00	s	TANTALUM 2.2uF 20% 10V
C104	1-131-410-00	s	TANTALUM 0.68uF 20% 16V
C105	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C106	1-131-375-00	s	TANTALUM 4.7uF 20% 10V
C201	1-131-375-00	s	TANTALUM 4.7uF 20% 10V
C202	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C203	1-131-419-00	s	TANTALUM 2.2uF 20% 10V
C204	1-131-410-00	s	TANTALUM 0.68uF 20% 16V
C205	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C206	1-131-375-00	s	TANTALUM 4.7uF 20% 10V
C301	1-126-153-11	s	ELECT 22uF 20% 6.3V
C302	1-124-234-00	s	ELECT 22uF 20% 16V
C303	1-124-234-00	s	ELECT 22uF 20% 16V
C304	1-131-368-00	s	TANTALUM 3.3uF 20% 6.3V
C305	1-131-348-00	s	TANTALUM 1.5uF 20% 25V
C306	1-126-157-11	s	ELECT 10uF 20% 16V
#C307	1-162-541-11	s	CERAMIC 470PF 5% 100V
#C308	1-162-542-11	s	CERAMIC 680PF 5% 100V
#C309	1-162-540-11	s	CERAMIC 1500PF 5% 100V
C310	1-109-627-00	s	MICA 150PF 1% 500V
C311	1-109-627-00	s	MICA 150PF 1% 500V
#C312	1-102-108-21	s	CERAMIC 150PF 10% 50V
CN430	1-564-014-11	s	PIN, CONNECTOR 4P
CN431	1-564-013-11	o	PIN, CONNECTOR 3P
CN432	1-564-013-21	s	PIN, CONNECTOR 3P
CN433	1-506-487-11	s	PIN, CONNECTOR 8P
CN434	1-506-487-11	s	PIN, CONNECTOR 8P
CN436	1-506-481-11	s	PIN, CONNECTOR 2P
CP301	1-464-372-11	s	OSCILLATOR BLOCK, BIAS
D101	8-719-400-18	s	DIODE MA152WK
D102	8-719-104-34	s	DIODE 1S2836
D201	8-719-400-18	s	DIODE MA152WK
D202	8-719-104-34	s	DIODE 1S2836
D301	8-719-110-13	s	DIODE RD9.1ES-B2
D302	8-719-100-58	s	DIODE RD10E-B3
D303	8-719-400-18	s	DIODE MA152WK
Q101	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q102	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q103	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q104	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q105	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q106	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q107	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q108	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q109	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q110	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q201	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q202	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q203	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q204	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q205	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6

(AU-51A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q206	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q207	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q208	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q209	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q210	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q301	8-729-901-06	s	TRANSISTOR DTA144EK
Q302	8-729-205-95	s	TRANSISTOR 2SA1428-Y
Q303	8-729-205-95	s	TRANSISTOR 2SA1428-Y
Q304	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q305	8-729-901-01	s	TRANSISTOR DTC144EK
Q306	8-729-905-53	s	TRANSISTOR 2SD1055-R
R1	1-249-385-11	s	CARBON 2.2 5% 1/4W
R101	1-216-025-00	s	METAL 100 5% 1/10W
R102	1-216-089-91	s	METAL 47K 5% 1/10W
R103	1-216-089-91	s	METAL 47K 5% 1/10W
R104	1-216-073-00	s	METAL 10K 5% 1/10W
R105	1-216-073-00	s	METAL 10K 5% 1/10W
R106	1-216-073-00	s	METAL 10K 5% 1/10W
R107	1-216-065-00	s	METAL 4.7K 5% 1/10W
R108	1-216-085-00	s	METAL 33K 5% 1/10W
R109	1-216-033-00	s	METAL 220 5% 1/10W
R110	1-216-065-00	s	METAL 4.7K 5% 1/10W
R111	1-216-089-91	s	METAL 47K 5% 1/10W
R112	1-216-081-00	s	METAL 22K 5% 1/10W
R113	1-216-049-00	s	METAL 1K 5% 1/10W
R114	1-216-089-91	s	METAL 47K 5% 1/10W
R115	1-216-089-91	s	METAL 47K 5% 1/10W
R116	1-216-091-00	s	METAL 56K 5% 1/10W
R117	1-216-089-91	s	METAL 47K 5% 1/10W
R118	1-216-049-00	s	METAL 1K 5% 1/10W
R119	1-216-089-91	s	METAL 47K 5% 1/10W
R120	1-216-091-00	s	METAL 56K 5% 1/10W
R121	1-216-001-00	s	METAL 10 5% 1/10W
R122	1-216-073-00	s	METAL 10K 5% 1/10W
R123	1-216-077-00	s	METAL 15K 5% 1/10W
R124	1-216-049-00	s	METAL 1K 5% 1/10W
R125	1-216-089-91	s	METAL 47K 5% 1/10W
R126	1-216-089-91	s	METAL 47K 5% 1/10W
R201	1-216-025-00	s	METAL 100 5% 1/10W
R202	1-216-089-91	s	METAL 47K 5% 1/10W
R203	1-216-089-91	s	METAL 47K 5% 1/10W
R204	1-216-073-00	s	METAL 10K 5% 1/10W
R205	1-216-073-00	s	METAL 10K 5% 1/10W
R206	1-216-073-00	s	METAL 10K 5% 1/10W
R207	1-216-065-00	s	METAL 4.7K 5% 1/10W
R208	1-216-085-00	s	METAL 33K 5% 1/10W
R209	1-216-033-00	s	METAL 220 5% 1/10W
R210	1-216-065-00	s	METAL 4.7K 5% 1/10W
R211	1-216-089-91	s	METAL 47K 5% 1/10W
R212	1-216-081-00	s	METAL 22K 5% 1/10W
R213	1-216-049-00	s	METAL 1K 5% 1/10W
R214	1-216-089-91	s	METAL 47K 5% 1/10W
R215	1-216-089-91	s	METAL 47K 5% 1/10W
R216	1-216-091-00	s	METAL 56K 5% 1/10W
R217	1-216-089-91	s	METAL 47K 5% 1/10W
R218	1-216-049-00	s	METAL 1K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(AU-51A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R219	1-216-089-91	s	METAL 47K 5% 1/10W
R220	1-216-091-00	s	METAL 56K 5% 1/10W
R221	1-216-001-00	s	METAL 10 5% 1/10W
R222	1-216-073-00	s	METAL 10K 5% 1/10W
R223	1-216-077-00	s	METAL 15K 5% 1/10W
R224	1-216-089-91	s	METAL 47K 5% 1/10W
R225	1-216-049-00	s	METAL 1K 5% 1/10W
R226	1-216-089-91	s	METAL 47K 5% 1/10W
R301	1-216-049-00	s	METAL 1K 5% 1/10W
R303	1-216-089-91	s	METAL 47K 5% 1/10W
R304	1-216-089-91	s	METAL 47K 5% 1/10W
R305	1-216-081-00	s	METAL 22K 5% 1/10W
R306	1-216-073-00	s	METAL 10K 5% 1/10W
R307	1-216-085-00	s	METAL 33K 5% 1/10W
R308	1-216-073-00	s	METAL 10K 5% 1/10W
R309	1-216-049-00	s	METAL 1K 5% 1/10W
R310	1-216-061-00	s	METAL 3.3K 5% 1/10W
R311	1-249-385-11	s	CARBON 2.2 5% 1/4W
R312	1-249-385-11	s	CARBON 2.2 5% 1/4W
#RV101	1-230-527-11	s	RES, ADJ, METAL GLAZE 100K
#RV201	1-230-527-11	s	RES, ADJ, METAL GLAZE 100K
#RV301	1-230-526-11	s	RES, ADJ, METAL GLAZE 47K
RY1	1-515-586-11	s	RELAY (DS-2)

AU-64 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6713-230-A	o	MOUNTED CIRCUIT BOARD, AU-64
1pc	1-615-980-11	o	PRINTED CIRCUIT BOARD, DUS-94
2pcs	4-352-844-01	o	PIN, LEAD, COATING
C101	1-130-484-00	s	MYLAR 0.012uF 5% 50V
C102	1-130-488-00	s	MYLAR 0.027uF 5% 50V
C103	1-130-484-00	s	MYLAR 0.012uF 5% 50V
C104	1-130-489-11	s	MYLAR 0.033uF 5% 50V
C105	1-130-486-00	s	MYLAR 0.018uF 5% 50V
C106	1-130-486-00	s	MYLAR 0.018uF 5% 50V
C107	1-126-157-11	s	ELECT 10uF 20% 6.3V
C108	1-126-157-11	s	ELECT 10uF 20% 6.3V
C109	1-126-157-11	s	ELECT 10uF 20% 6.3V
C110	1-126-157-11	s	ELECT 10uF 20% 6.3V
C111	1-126-157-11	s	ELECT 10uF 20% 6.3V
C113	1-126-157-11	s	ELECT 10uF 20% 6.3V
C114	1-126-157-11	s	ELECT 10uF 20% 6.3V
C115	1-126-157-11	s	ELECT 10uF 20% 6.3V
C116	1-126-157-11	s	ELECT 10uF 20% 6.3V
#C120	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C121	1-131-360-00	s	TANTALUM 15uF 10% 25V
C122	1-131-351-00	s	TANTALUM 4.7uF 10% 35V
C123	1-130-494-11	s	MYLAR 0.082uF 5% 50V
C124	1-131-360-00	s	TANTALUM 15uF 10% 25V

(AU-64 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C125	1-131-351-00	s	TANTALUM 4.7uF 10% 35V
C126	1-130-494-11	s	MYLAR 0.082uF 5% 50V
C127	1-124-464-11	s	ELECT 0.22uF 20% 50V
C128	1-126-157-11	s	ELECT 10uF 20% 6.3V
C129	1-163-035-00	s	CERAMIC 0.047uF 50V
C130	1-163-035-00	s	CERAMIC 0.047uF 50V
C140	1-163-035-00	s	CERAMIC 0.047uF 50V
C141	1-163-035-00	s	CERAMIC 0.047uF 50V
C142	1-163-133-00	s	CERAMIC 470PF 5% 50V
C143	1-163-035-00	s	CERAMIC 0.047uF 50V
CN441	1-562-480-11	s	CONNECTOR 10P
CN443	1-506-472-11	s	PIN, CONNECTOR 7P
CN445	1-506-468-11	s	PIN, CONNECTOR 3P
CN446	1-564-001-11	o	PIN, CONNECTOR 2P
CN447	1-506-467-11	s	PIN, CONNECTOR 2P
IC101	8-759-981-54	s	IC RC2041MD (RAYTHEON)
IC102	8-741-134-32	s	IC BX1343A (MURATA)
IC103	8-741-115-20	s	IC BX1152 (SONY)
IC104	8-759-745-64	s	IC NJM4560M (JRC)
IC105	8-759-745-64	s	IC NJM4560M (JRC)
IC106	8-759-745-64	s	IC NJM4560M (JRC)
IC107	8-759-205-78	s	IC TC504013BF (TOSHIBA)
IC108	8-759-300-71	s	IC HC14053BFP (HITACHI)
IC109	8-759-300-71	s	IC HD14053BFP (HITACHI)
Q101	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q102	8-729-901-01	s	TRANSISTOR DTC144EK
Q103	8-729-901-01	s	TRANSISTOR DTC144EK
Q104	8-729-901-01	s	TRANSISTOR DTC144EK
Q105	8-729-901-01	s	TRANSISTOR DTC144EK
R101	1-216-121-00	s	METAL 1M 5% 1/10W
R102	1-216-121-00	s	METAL 1M 5% 1/10W
#R103	1-215-487-00	s	METAL 560K 1% 1/4W
R104	1-216-121-00	s	METAL 1M 5% 1/10W
R105	1-216-113-00	s	METAL 470K 5% 1/10W
#R106	1-215-475-00	s	METAL 180K 1% 1/4W
R107	1-216-065-00	s	METAL 4.7K 5% 1/10W
R108	1-216-065-00	s	METAL 4.7K 5% 1/10W
R109	1-216-065-00	s	METAL 4.7K 5% 1/10W
R110	1-216-065-00	s	METAL 4.7K 5% 1/10W
R111	1-216-073-00	s	METAL 10K 5% 1/10W
R112	1-216-051-00	s	METAL 1.2K 5% 1/10W
R113	1-216-089-91	s	METAL 47K 5% 1/10W
R114	1-216-073-00	s	METAL 10K 5% 1/10W
R115	1-216-073-00	s	METAL 10K 5% 1/10W
R116	1-216-089-91	s	METAL 47K 5% 1/10W
R117	1-216-097-00	s	METAL 100K 5% 1/10W
R120	1-216-089-91	s	METAL 47K 5% 1/10W
R121	1-216-089-91	s	METAL 47K 5% 1/10W
R122	1-216-089-91	s	METAL 47K 5% 1/10W
R123	1-216-049-00	s	METAL 1K 5% 1/10W
R124	1-216-089-91	s	METAL 47K 5% 1/10W
R125	1-216-049-00	s	METAL 1K 5% 1/10W
R126	1-216-089-91	s	METAL 47K 5% 1/10W
R127	1-216-081-00	s	METAL 22K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(AU-64 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R128	1-216-081-00	s	METAL 22K 5% 1/10W
R129	1-216-073-00	s	METAL 10K 5% 1/10W
R130	1-216-041-00	s	METAL 470 5% 1/10W
R131	1-216-089-91	s	METAL 47K 5% 1/10W
R132	1-216-097-00	s	METAL 100K 5% 1/10W
R133	1-216-049-00	s	METAL 1K 5% 1/10W
R134	1-216-053-00	s	METAL 1.5K 5% 1/10W
R135	1-216-073-00	s	METAL 10K 5% 1/10W
R136	1-216-075-00	s	METAL 12K 5% 1/10W
R137	1-216-067-00	s	METAL 5.6K 5% 1/10W
R138	1-216-051-00	s	METAL 1.2K 5% 1/10W
R139	1-216-053-00	s	METAL 1.5K 5% 1/10W
R140	1-216-073-00	s	METAL 10K 5% 1/10W
R141	1-216-075-00	s	METAL 12K 5% 1/10W
R142	1-216-073-00	s	METAL 10K 5% 1/10W
R143	1-216-085-00	s	METAL 33K 5% 1/10W
R144	1-216-073-00	s	METAL 10K 5% 1/10W
R145	1-216-073-00	s	METAL 10K 5% 1/10W
R153	1-216-117-00	s	METAL 680K 5% 1/10W
R154	1-216-089-91	s	METAL 47K 5% 1/10W
R155	1-216-089-91	s	METAL 47K 5% 1/10W
#R156	1-216-089-91	s	METAL 47K 5% 1/10W
#R157	1-216-089-91	s	METAL 47K 5% 1/10W
RV101	1-228-474-00	s	RES, ADJ, CERMET 10K

AU-65 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6713-231-A	o	MOUNTED CIRCUIT BOARD, AU-65
1pc	1-615-980-11	o	PRINTED CIRCUIT BOARD, DUS-94
1pc	4-352-844-01	o	PIN, LEAD, COATING
C201	1-130-484-00	s	MYLAR 0.012uF 5% 50V
C202	1-130-488-00	s	MYLAR 0.027uF 5% 50V
C203	1-130-484-00	s	MYLAR 0.012uF 5% 50V
C204	1-130-489-11	s	MYLAR 0.033uF 5% 50V
C205	1-130-486-00	s	MYLAR 0.018uF 5% 50V
C206	1-130-486-00	s	MYLAR 0.018uF 5% 50V
C207	1-126-157-11	s	ELECT 10uF 20% 6.3V
C208	1-126-157-11	s	ELECT 10uF 20% 6.3V
C209	1-126-157-11	s	ELECT 10uF 20% 6.3V
C210	1-126-157-11	s	ELECT 10uF 20% 6.3V
C211	1-126-157-11	s	ELECT 10uF 20% 6.3V
C212	1-126-157-11	s	ELECT 10uF 20% 6.3V
C213	1-126-157-11	s	ELECT 10uF 20% 6.3V
C214	1-126-157-11	s	ELECT 10uF 20% 6.3V
C215	1-126-157-11	s	ELECT 10uF 20% 6.3V
C216	1-126-157-11	s	ELECT 10uF 20% 6.3V
C231	1-163-035-00	s	CERAMIC 0.047uF 50V
C232	1-163-035-00	s	CERAMIC 0.047uF 50V
C233	1-126-154-11	s	ELECT 47uF 20% 6.3V
C234	1-126-154-11	s	ELECT 47uF 20% 6.3V

(AU-65 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C235	1-126-163-11	s	ELECT 4.7uF 20% 16V
C236	1-126-163-11	s	ELECT 4.7uF 20% 16V
C240	1-163-035-00	s	CERAMIC 0.047uF 50V
C242	1-163-133-00	s	CERAMIC 470PF 5% 50V
C243	1-163-035-00	s	CERAMIC 0.047uF 50V
CN461	1-564-490-11	o	PIN, CONNECTOR 10P
CN462	1-564-013-41	s	PIN, CONNECTOR 3P
CN463	1-506-487-11	s	PIN, CONNECTOR 8P
CN464	1-506-481-11	s	PIN, CONNECTOR 2P
CN465	1-564-013-31	s	PIN, CONNECTOR 3P
CN466	1-506-468-11	s	PIN, CONNECTOR 3P
IC201	8-759-981-54	s	IC RC2041MD (RAYTHEON)
IC202	8-741-134-32	s	IC BX1343A (MURATA)
IC203	8-741-115-20	s	IC BX1152 (SONY)
IC204	8-759-745-64	s	IC NJM4560M (JRC)
IC205	8-759-745-64	s	IC NJM4560M (JRC)
IC208	8-759-300-71	s	IC HD14053BFP (HITACHI)
IC209	8-759-300-71	s	IC HD14053BFP (HITACHI)
Q201	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q202	8-729-901-01	s	TRANSISTOR DTC144EK
Q203	8-729-901-01	s	TRANSISTOR DTC144EK
Q204	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q205	8-729-905-53	s	TRANSISTOR 2SD1055-R
Q206	8-729-205-95	s	TRANSISTOR 2SA1428-Y
#R157	1-216-089-91	s	METAL 47K 5% 1/10W
R201	1-216-121-00	s	METAL 1M 5% 1/10W
R202	1-216-121-00	s	METAL 1M 5% 1/10W
#R203	1-215-487-00	s	METAL 560K 1% 1/4W
R204	1-216-121-00	s	METAL 1M 5% 1/10W
R205	1-216-113-00	s	METAL 470K 5% 1/10W
#R206	1-215-475-00	s	METAL 180K 1% 1/4W
R207	1-216-065-00	s	METAL 4.7K 5% 1/10W
R208	1-216-065-00	s	METAL 4.7K 5% 1/10W
R209	1-216-065-00	s	METAL 4.7K 5% 1/10W
R210	1-216-065-00	s	METAL 4.7K 5% 1/10W
R211	1-216-073-00	s	METAL 10K 5% 1/10W
R212	1-216-051-00	s	METAL 1.2K 5% 1/10W
R213	1-216-089-91	s	METAL 47K 5% 1/10W
R214	1-216-073-00	s	METAL 10K 5% 1/10W
R215	1-216-073-00	s	METAL 10K 5% 1/10W
R216	1-216-089-91	s	METAL 47K 5% 1/10W
R217	1-216-097-00	s	METAL 100K 5% 1/10W
R218	1-216-049-00	s	METAL 1K 5% 1/10W
R219	1-216-081-00	s	METAL 22K 5% 1/10W
R220	1-216-089-91	s	METAL 47K 5% 1/10W
R221	1-216-089-91	s	METAL 47K 5% 1/10W
R222	1-216-089-91	s	METAL 47K 5% 1/10W
R223	1-216-049-00	s	METAL 1K 5% 1/10W
R224	1-216-089-91	s	METAL 47K 5% 1/10W
R225	1-216-049-00	s	METAL 1K 5% 1/10W
R226	1-216-089-91	s	METAL 47K 5% 1/10W
R227	1-216-081-00	s	METAL 22K 5% 1/10W
R228	1-216-081-00	s	METAL 22K 5% 1/10W
R229	1-216-073-00	s	METAL 10K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(AU-65 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R230	1-216-041-00	s	METAL 470 5% 1/10W
R250	1-249-417-11	s	CARBON 1K 5% 1/4W
R251	1-249-417-11	s	CARBON 1K 5% 1/4W
R252	1-216-073-00	s	METAL 10K 5% 1/10W
R253	1-216-117-00	s	METAL 680K 5% 1/10W
R254	1-216-089-91	s	METAL 47K 5% 1/10W
R255	1-216-089-91	s	METAL 47K 5% 1/10W
#R257	1-247-871-00	s	CARBON 47K 5% 1/6W
RV201	1-228-474-00	s	RES, ADJ, CERMET 10K

BF-12 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6711-648-A	o	MOUNTED CIRCUIT BOARD, BF-12
C1	1-163-035-00	s	CERAMIC 0.047uF 50V
C2	1-163-035-00	s	CERAMIC 0.047uF 50V
C3	1-126-157-11	s	ELECT 10uF 20% 16V
C4	1-107-164-00	s	MICA 51PF 5% 50V
C5	1-163-035-00	s	CERAMIC 0.047uF 50V
C6	1-107-076-00	s	MICA 43PF 5% 50V
C7	1-163-035-00	s	CERAMIC 0.047uF 50V
C8	1-163-035-00	s	CERAMIC 0.047uF 50V
C9	1-162-714-11	s	CERAMIC 150PF 5% 50V
C10	1-124-589-11	s	ELECT 47uF 20% 10V
C11	1-124-589-11	s	ELECT 47uF 20% 10V
C12	1-126-157-11	s	ELECT 10uF 20% 16V
C13	1-126-157-11	s	ELECT 10uF 20% 16V
C14	1-126-157-11	s	ELECT 10uF 20% 16V
C15	1-124-584-00	s	ELECT 100uF 20% 10V
C16	1-124-589-11	s	ELECT 47uF 20% 16V
C17	1-126-157-11	s	ELECT 10uF 20% 16V
C18	1-124-589-11	s	ELECT 47uF 20% 16V
C19	1-124-589-11	s	ELECT 47uF 20% 16V
C20	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
CN1	1-562-639-11	o	SOCKET, CONNECTOR 10P
CN2	1-562-639-11	o	SOCKET, CONNECTOR 10P
D1	8-719-911-19	s	DIODE 1SS119
D2	8-719-911-19	s	DIODE 1SS119
D3	8-719-911-19	s	DIODE 1SS119
D4	8-719-911-19	s	DIODE 1SS119
IC1	8-752-006-00	s	IC CX20060 (SONY)
IC2	8-759-324-11	s	IC HA12411 (HITACHI)
IC3	8-759-140-53	s	IC UPD4053BC (NEC)
L1	1-410-979-11	s	INDUCTOR 56uH
L2	1-408-964-11	s	INDUCTOR 3.3uH
L3	1-408-989-21	s	INDUCTOR 470uH
L4	1-407-169-XX	s	INDUCTOR 100uH
L5	1-407-169-XX	s	INDUCTOR 100uH
L6	1-407-169-XX	s	INDUCTOR 100uH

(BF-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q1	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q2	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q3	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q4	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q5	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q6	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q7	8-729-230-49	s	TRANSISTOR 2SC2712-YG
R1	1-216-049-00	s	METAL 1K 5% 1/10W
R2	1-216-049-00	s	METAL 1K 5% 1/10W
R4	1-216-073-00	s	METAL 10K 5% 1/10W
R6	1-216-025-00	s	METAL 100 5% 1/10W
R7	1-216-037-00	s	METAL 330 5% 1/10W
R8	1-216-049-00	s	METAL 1K 5% 1/10W
R9	1-216-085-00	s	METAL 33K 5% 1/10W
R10	1-216-071-00	s	METAL 8.2K 5% 1/10W
R11	1-215-428-00	s	METAL 2K 1% 1/4W
R12	1-216-041-00	s	METAL 470 5% 1/10W
R13	1-216-061-00	s	METAL 3.3K 5% 1/10W
R14	1-216-025-00	s	METAL 100 5% 1/10W
R15	1-216-029-00	s	METAL 150 5% 1/10W
R16	1-216-105-00	s	METAL 220K 5% 1/10W
R17	1-216-093-00	s	METAL 68K 5% 1/10W
R18	1-215-422-00	s	METAL 1.1K 1% 1/4W
R19	1-216-049-00	s	METAL 1K 5% 1/10W
R20	1-215-432-00	s	METAL 3K 1% 1/4W
R21	1-216-053-00	s	METAL 1.5K 5% 1/10W
R23	1-215-436-00	s	METAL 4.3K 1% 1/4W
R24	1-216-063-00	s	METAL 3.9K 5% 1/10W
R25	1-216-105-00	s	METAL 220K 5% 1/10W
R26	1-216-097-00	s	METAL 100K 5% 1/10W
R27	1-216-097-00	s	METAL 100K 5% 1/10W
R28	1-216-065-00	s	METAL 4.7K 5% 1/10W
R29	1-216-065-00	s	METAL 4.7K 5% 1/10W
#R30	1-216-089-91	s	METAL 47K 5% 1/10W
R31	1-216-067-00	s	METAL 5.6K 5% 1/10W
R32	1-216-037-00	s	METAL 330 5% 1/10W
R33	1-216-083-00	s	METAL 27K 5% 1/10W
R34	1-216-067-00	s	METAL 5.6K 5% 1/10W
R35	1-215-404-00	s	METAL 200 1% 1/4W
R36	1-215-394-00	s	METAL 75 1% 1/4W
R37	1-216-073-00	s	METAL 10K 5% 1/10W
#R39	1-216-089-91	s	METAL 47K 5% 1/10W
RV1	1-228-518-00	s	RES, ADJ, METAL GLAZE 1K

CM-19A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6713-234-A	o	MOUNTED CIRCUIT BOARD, CM-19A
1pc	1-562-147-11	o	HOUSING, CONNECTOR 2P
1pc	1-562-148-11	o	HOUSING, CONNECTOR 3P
1pc	1-562-150-11	o	HOUSING, CONNECTOR 5P
2pcs	1-562-605-11	o	CONTACT, CONNECTOR

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(CM-19A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
2pcs	1-562-609-11	o	HOUSING, CONNECTOR
C1	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
#C2	1-126-162-11	s	ELECT 3.3uF 20% 50V
#C3	1-126-162-11	s	ELECT 3.3uF 20% 50V
C8	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
#C9	1-162-199-31	s	CERAMIC 10PF 5% 50V
C10	1-163-251-11	s	CERAMIC 100PF 5% 50V
C11	1-163-251-11	s	CERAMIC 100PF 5% 50V
#C14	1-162-199-31	s	CERAMIC 10PF 5% 50V
#C21	1-163-227-11	s	CERAMIC 10PF 0.5PF 50V
C51	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
#C52	1-126-162-11	s	ELECT 3.3uF 20% 50V
#C53	1-126-162-11	s	ELECT 3.3uF 20% 50V
C60	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
C61	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
#C63	1-162-199-31	s	CERAMIC 10PF 5% 50V
#C67	1-162-199-31	s	CERAMIC 10PF 5% 50V
C70	1-163-251-11	s	CERAMIC 100PF 5% 50V
C71	1-163-251-11	s	CERAMIC 100PF 5% 50V
#C73	1-163-227-11	s	CERAMIC 10PF 0.5PF 50V
C100	1-126-154-11	s	ELECT 47uF 20% 6.3V
C101	1-126-154-11	s	ELECT 47uF 20% 6.3V
C114	1-126-157-11	s	ELECT 10uF 20% 16V
C214	1-126-157-11	s	ELECT 10uF 20% 16V
CN471	1-564-013-11	o	PIN, CONNECTOR 3P
CN472	1-564-013-31	s	PIN, CONNECTOR 3P
CN473	1-506-468-11	s	PIN, CONNECTOR 3P
CN475	1-564-001-11	o	PIN, CONNECTOR 2P
IC1	8-759-981-54	s	IC RC2041MD (RAYTHEON)
IC2	8-759-981-54	s	IC RC2041MD (RAYTHEON)
IC3	8-759-981-54	s	IC RC2041MD (RAYTHEON)
IC51	8-759-981-54	s	IC RC2041MD (RAYTHEON)
IC52	8-759-981-54	s	IC RC2041MD (RAYTHEON)
L1	1-407-519-00	s	INDUCTOR 8uH
L2	1-407-519-00	s	INDUCTOR 8uH
L51	1-407-519-00	s	INDUCTOR 8uH
L52	1-407-519-00	s	INDUCTOR 8uH
Q1	8-729-901-01	s	TRANSISTOR DTC144EK
R1	1-216-067-00	s	METAL 5.6K 5% 1/10W
R2	1-216-067-00	s	METAL 5.6K 5% 1/10W
R3	1-216-031-00	s	METAL 180 5% 1/10W
R4	1-216-097-00	s	METAL 100K 5% 1/10W
R5	1-216-065-00	s	METAL 4.7K 5% 1/10W
R6	1-216-081-00	s	METAL 22K 5% 1/10W
R7	1-216-097-00	s	METAL 100K 5% 1/10W
R8	1-216-081-00	s	METAL 22K 5% 1/10W
R9	1-215-437-00	s	METAL 4.7K 1% 1/4W
R10	1-215-403-00	s	METAL 180 1% 1/4W
R13	1-215-403-00	s	METAL 180 1% 1/4W
R14	1-215-437-00	s	METAL 4.7K 1% 1/4W
R15	1-216-073-00	s	METAL 10K 5% 1/10W
R16	1-215-437-00	s	METAL 4.7K 1% 1/4W
R17	1-215-437-00	s	METAL 4.7K 1% 1/4W

(CM-19A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R18	1-216-065-00	s	METAL 4.7K 5% 1/10W
R19	1-216-063-00	s	METAL 3.9K 5% 1/10W
R20	1-216-065-00	s	METAL 4.7K 5% 1/10W
R21	1-216-065-00	s	METAL 4.7K 5% 1/10W
R51	1-216-065-00	s	METAL 4.7K 5% 1/10W
R52	1-216-075-00	s	METAL 12K 5% 1/10W
R53	1-216-065-00	s	METAL 4.7K 5% 1/10W
R54	1-216-031-00	s	METAL 180 5% 1/10W
R55	1-216-067-00	s	METAL 5.6K 5% 1/10W
R56	1-216-067-00	s	METAL 5.6K 5% 1/10W
R57	1-216-065-00	s	METAL 4.7K 5% 1/10W
R58	1-216-097-00	s	METAL 100K 5% 1/10W
R59	1-216-081-00	s	METAL 22K 5% 1/10W
R60	1-215-403-00	s	METAL 180 1% 1/4W
R61	1-216-097-00	s	METAL 100K 5% 1/10W
R62	1-216-081-00	s	METAL 22K 5% 1/10W
R63	1-215-437-00	s	METAL 4.7K 1% 1/4W
R66	1-215-403-00	s	METAL 180 1% 1/4W
R67	1-215-437-00	s	METAL 4.7K 1% 1/4W
R68	1-215-437-00	s	METAL 4.7K 1% 1/4W
R69	1-215-437-00	s	METAL 4.7K 1% 1/4W
R70	1-216-065-00	s	METAL 4.7K 5% 1/10W
R71	1-216-063-00	s	METAL 3.9K 5% 1/10W
R72	1-216-065-00	s	METAL 4.7K 5% 1/10W
R73	1-216-065-00	s	METAL 4.7K 5% 1/10W
R75	1-216-073-00	s	METAL 10K 5% 1/10W
RV1	1-228-457-00	s	RES, ADJ, CERMET 2K
RV51	1-228-457-00	s	RES, ADJ, CERMET 2K
S1	1-554-970-11	s	SWITCH, SLIDE
S2	1-554-972-11	s	SWITCH, SLIDE
S3	1-554-971-11	s	SWITCH, SLIDE
S5	1-554-971-11	s	SWITCH, SLIDE

CN-26 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-615-976-11	o	PRINTED CIRCUIT BOARD, CN-26

CN-100 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-615-979-11	o	PRINTED CIRCUIT BOARD, CN-100
C1	1-125-393-11	s	ELECT 0.4uF 5.5V

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

CR-26 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6711-649-A	o	COMPLETE PCB, CR-26
1pc	3-694-762-01	o	LID, REAR, CR SHIELD
1pc	3-694-759-01	o	LID, CR SHIELD
8pcs	3-621-124-00	o	SPACER
C1	1-130-479-00	s	MYLAR 0.0047uF 5% 50V
C2	1-130-481-00	s	MYLAR 0.0068uF 5% 50V
C3	1-131-344-00	s	TANTALUM 0.33uF 10% 35V
C4	1-130-478-00	s	MYLAR 0.0039uF 5% 50V
C5	1-107-085-00	s	MICA 100PF 5% 50V
C6	1-126-157-11	s	ELECT 10uF 20% 10V
C7	1-130-481-00	s	MYLAR 0.0068uF 5% 50V
C8	1-131-351-00	s	TANTALUM 4.7uF 10% 25V
C9	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C10	1-107-165-00	s	MICA 56PF 5% 50V
C11	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C12	1-162-710-11	s	CERAMIC 100PF 5% 50V
C13	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C14	1-131-344-00	s	TANTALUM 0.33uF 10% 35V
C15	1-124-584-00	s	ELECT 100uF 20% 10V
C16	1-163-035-00	s	CERAMIC 0.047uF 50V
C17	1-124-589-11	s	ELECT 47uF 20% 16V
C18	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C20	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C21	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C22	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C23	1-131-343-00	s	TANTALUM 0.22uF 10% 35V
C24	1-130-478-00	s	MYLAR 0.0039uF 5% 50V
C25	1-131-351-00	s	TANTALUM 4.7uF 10% 25V
C26	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C27	1-163-035-00	s	CERAMIC 0.047uF 50V
#C28	1-107-049-00	s	MICA 8.2PF 0.5PF 500V
C29	1-163-035-00	s	CERAMIC 0.047uF 50V
C30	1-163-035-00	s	CERAMIC 0.047uF 50V
C31	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C32	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C33	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C35	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C36	1-131-349-00	s	TANTALUM 2.2uF 10% 25V
C37	1-107-159-00	s	MICA 33PF 5% 500V
C38	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C39	1-107-202-00	s	MICA 10PF 5% 500V
C40	1-163-035-00	s	CERAMIC 0.047uF 50V
C41	1-163-035-00	s	CERAMIC 0.047uF 50V
C42	1-126-160-11	s	ELECT 1uF 20% 50V
C43	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C44	1-163-035-00	s	CERAMIC 0.047uF 50V
C45	1-131-368-00	s	TANTALUM 3.3uF 10% 16V
C46	1-131-367-00	s	TANTALUM 22uF 10% 16V
C47	1-131-368-00	s	TANTALUM 3.3uF 10% 16V
C48	1-131-367-00	s	TANTALUM 22uF 10% 16V
C49	1-163-035-00	s	CERAMIC 0.047uF 50V
C50	1-101-886-00	s	CERAMIC 62PF 5% 50V
C51	1-163-035-00	s	CERAMIC 0.047uF 50V
C53	1-124-589-11	s	ELECT 47uF 20% 16V
C55	1-163-035-00	s	CERAMIC 0.047uF 50V
C56	1-124-589-11	s	ELECT 47uF 20% 16V
C57	1-124-589-11	s	ELECT 47uF 20% 16V

(CR-26 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C58	1-163-035-00	s	CERAMIC 0.047uF 50V
C59	1-124-589-11	s	ELECT 47uF 20% 16V
C60	1-163-035-00	s	CERAMIC 0.047uF 50V
C61	1-163-035-00	s	CERAMIC 0.047uF 50V
C62	1-124-589-11	s	ELECT 47uF 20% 16V
C63	1-130-487-00	s	MYLAR 0.022uF 5% 50V
C64	1-163-035-00	s	CERAMIC 0.047uF 50V
C67	1-163-035-00	s	CERAMIC 0.047uF 50V
C68	1-124-589-11	s	ELECT 47uF 20% 16V
C69	1-163-035-00	s	CERAMIC 0.047uF 50V
C70	1-126-101-11	s	ELECT 100uF 20% 16V
C71	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C72	1-126-160-11	s	ELECT 1uF 20% 50V
C73	1-162-718-11	s	CERAMIC 220PF 5% 50V
#C74	1-163-035-00	s	CERAMIC 0.047uF 50V
#C75	1-163-100-00	s	CERAMIC 20PF 5% 50V
#C76	1-107-044-00	s	MICA 3.3PF 0.5PF 500V
CN22	1-564-492-11	o	PIN, CONNECTOR 20P
D1	8-719-400-18	s	DIODE MA152WK
D3	8-719-815-59	s	DIODE 1S1555-S
D4	8-719-915-43	s	DIODE FC54M
D5	8-719-815-59	s	DIODE 1S1555-S
D6	8-719-400-18	s	DIODE MA152WK
D7	8-719-101-98	s	DIODE 1SS97-0
D8	8-719-101-98	s	DIODE 1SS97-0
D9	8-719-911-19	s	DIODE 1SS119
DL1	1-415-402-11	s	DELAY LINE 300nS (1.0MHz)
E1	3-657-235-00	o	POINT, TEST
E2	3-657-235-00	o	POINT, TEST
E3	3-657-235-00	o	POINT, TEST
FL1	1-231-377-21	s	FILTER, BAND PASS
FL2	1-235-476-11	s	FILTER, BAND PASS
FL3	1-235-471-11	s	FILTER, LOW PASS
IC1	8-759-908-59	s	IC CX859 (SONY)
IC2	8-750-000-46	s	IC CX872 (SONY)
IC3	8-741-126-40	s	IC BX1264 (SONY)
IC4	8-752-006-12	s	IC CX20061 (SONY)
IC5	8-741-125-10	s	IC BX1251 (SONY)
IC6	8-759-208-11	s	IC UPD4053BC (NEC)
IC7	8-741-126-20	s	IC BX1262 (SONY)
IC8	8-752-006-12	s	IC CX20061 (SONY)
L1	1-408-972-21	s	INDUCTOR 15uH
L2	1-408-988-21	s	INDUCTOR 390uH
L3	1-408-976-21	s	INDUCTOR 33uH
L4	1-408-072-00	s	INDUCTOR 47uH
L5	1-408-989-21	s	INDUCTOR 470uH
L6	1-408-989-21	s	INDUCTOR 470uH
L7	1-408-977-21	s	INDUCTOR 39uH
L9	1-407-169-XX	s	INDUCTOR 100uH
L10	1-407-169-XX	s	INDUCTOR 100uH
L12	1-407-169-XX	s	INDUCTOR 100uH

Note: For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(CR-26 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
L13	1-407-169-XX	s	INDUCTOR 100uH
L15	1-407-169-XX	s	INDUCTOR 100uH
L16	1-407-169-XX	s	INDUCTOR 100uH
LV1	1-407-572-00	s	COIL, VARIABLE 33uH
Q1	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q2	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q3	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q4	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q5	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q6	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q8	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q9	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q10	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q11	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q12	8-729-230-49	s	TRANSISTOR 2SC2712-YG
#Q14	8-729-107-45	s	TRANSISTOR 2SD1030-STX
R1	1-216-077-00	s	METAL 15K 5% 1/10W
R2	1-216-097-00	s	METAL 100K 5% 1/10W
R3	1-216-097-00	s	METAL 100K 5% 1/10W
R4	1-216-047-00	s	METAL 820 5% 1/10W
R5	1-215-428-00	s	METAL 2K 1% 1/4W
R6	1-216-049-00	s	METAL 1K 5% 1/10W
R7	1-216-689-11	s	METAL 39K 5% 1/10W
R8	1-216-083-00	s	METAL 27K 5% 1/10W
R9	1-216-049-00	s	METAL 1K 5% 1/10W
R10	1-216-073-00	s	METAL 10K 5% 1/10W
R11	1-216-063-00	s	METAL 3.9K 5% 1/10W
R12	1-216-097-00	s	METAL 100K 5% 1/10W
R13	1-216-049-00	s	METAL 1K 5% 1/10W
R14	1-216-073-00	s	METAL 10K 5% 1/10W
R16	1-216-097-00	s	METAL 100K 5% 1/10W
R17	1-216-049-00	s	METAL 1K 5% 1/10W
R18	1-216-033-00	s	METAL 220 5% 1/10W
R19	1-216-085-00	s	METAL 33K 5% 1/10W
R20	1-215-436-00	s	METAL 4.3K 1% 1/4W
R21	1-216-049-00	s	METAL 1K 5% 1/10W
R22	1-216-063-00	s	METAL 3.9K 5% 1/10W
R23	1-216-071-00	s	METAL 8.2K 5% 1/10W
R24	1-216-121-00	s	METAL 1M 5% 1/10W
R25	1-215-490-00	s	METAL 750K 1% 1/4W
R26	1-216-049-00	s	METAL 1K 5% 1/10W
R28	1-216-077-00	s	METAL 15K 5% 1/10W
R29	1-216-089-91	s	METAL 47K 5% 1/10W
R30	1-215-449-00	s	METAL 15K 1% 1/4W
R31	1-215-459-00	s	METAL 39K 1% 1/4W
R32	1-216-049-00	s	METAL 1K 5% 1/10W
R33	1-216-049-00	s	METAL 1K 5% 1/10W
R34	1-216-013-00	s	METAL 33 5% 1/10W
R39	1-215-438-00	s	METAL 5.1K 1% 1/4W
R40	1-215-438-00	s	METAL 5.1K 1% 1/4W
#R41	1-216-055-00	s	METAL 1.8K 5% 1/10W
R42	1-216-067-00	s	METAL 5.6K 5% 1/10W
R43	1-216-097-00	s	METAL 100K 5% 1/10W
R44	1-216-073-00	s	METAL 10K 5% 1/10W
R45	1-216-073-00	s	METAL 10K 5% 1/10W
R46	1-216-057-00	s	METAL 2.2K 5% 1/10W

(CR-26 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R48	1-216-081-00	s	METAL 22K 5% 1/10W
R49	1-216-081-00	s	METAL 22K 5% 1/10W
R50	1-216-073-00	s	METAL 10K 5% 1/10W
R51	1-216-089-91	s	METAL 47K 5% 1/10W
R52	1-215-466-00	s	METAL 75K 1% 1/4W
R53	1-215-432-00	s	METAL 3K 1% 1/4W
R54	1-215-452-00	s	METAL 20K 1% 1/4W
R55	1-216-067-00	s	METAL 5.6K 5% 1/10W
R56	1-215-414-00	s	METAL 510 1% 1/4W
R57	1-215-414-00	s	METAL 510 1% 1/4W
R58	1-216-049-00	s	METAL 1K 5% 1/10W
R59	1-216-049-00	s	METAL 1K 5% 1/10W
R60	1-216-057-00	s	METAL 2.2K 5% 1/10W
R61	1-216-073-00	s	METAL 10K 5% 1/10W
R62	1-216-041-00	s	METAL 470 5% 1/10W
R63	1-216-051-00	s	METAL 1.2K 5% 1/10W
R65	1-215-474-00	s	METAL 160K 1% 1/4W
R66	1-216-061-00	s	METAL 3.3K 5% 1/10W
R67	1-216-073-00	s	METAL 10K 5% 1/10W
R68	1-216-097-00	s	METAL 100K 5% 1/10W
R69	1-216-049-00	s	METAL 1K 5% 1/10W
R70	1-216-089-91	s	METAL 47K 5% 1/10W
R71	1-216-089-91	s	METAL 47K 5% 1/10W
R72	1-216-049-00	s	METAL 1K 5% 1/10W
R73	1-216-089-91	s	METAL 47K 5% 1/10W
R74	1-216-105-00	s	METAL 220K 5% 1/10W
R75	1-216-073-00	s	METAL 10K 5% 1/10W
R76	1-216-049-00	s	METAL 1K 5% 1/10W
R78	1-216-077-00	s	METAL 15K 5% 1/10W
R79	1-216-057-00	s	METAL 2.2K 5% 1/10W
R80	1-216-061-00	s	METAL 3.3K 5% 1/10W
R81	1-216-049-00	s	METAL 1K 5% 1/10W
R82	1-216-073-00	s	METAL 10K 5% 1/10W
R83	1-215-490-00	s	METAL 750K 1% 1/4W
R84	1-216-061-00	s	METAL 3.3K 5% 1/10W
R85	1-216-073-00	s	METAL 10K 5% 1/10W
R86	1-216-073-00	s	METAL 10K 5% 1/10W
R87	1-216-073-00	s	METAL 10K 5% 1/10W
R89	1-216-073-00	s	METAL 10K 5% 1/10W
R90	1-216-073-00	s	METAL 10K 5% 1/10W
R91	1-216-049-00	s	METAL 1K 5% 1/10W
R92	1-216-073-00	s	METAL 10K 5% 1/10W
R93	1-216-073-00	s	METAL 10K 5% 1/10W
R94	1-216-073-00	s	METAL 10K 5% 1/10W
R95	1-216-073-00	s	METAL 10K 5% 1/10W
#R96	1-216-073-00	s	METAL 10K 5% 1/10W
#R97	1-216-073-00	s	METAL 10K 5% 1/10W
#R98	1-216-073-00	s	METAL 10K 5% 1/10W
#R99	1-216-081-00	s	METAL 22K 5% 1/10W
#R100	1-216-073-00	s	METAL 10K 5% 1/10W
#R101	1-216-049-00	s	METAL 1K 5% 1/10W
#R102	1-215-428-00	s	METAL 2K 1% 1/4W
#RV1	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV2	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV3	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV4	1-230-524-11	s	RES, ADJ, METAL GLAZE 22K
#RV5	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(CR-26 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
#RV6	1-230-524-11	s	RES, ADJ, METAL GLAZE 22K
#RV7	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV8	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV9	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV10	1-230-526-11	s	RES, ADJ, METAL GLAZE 47K
#RV11	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV12	1-230-524-11	s	RES, ADJ, METAL GLAZE 22K
#RV13	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
T1	1-425-880-21	s	TRANSFORMER, BURST AMP
TP8	3-657-235-00	o	POINT, TEST
TP9	3-657-235-00	o	POINT, TEST
TP10	3-657-235-00	o	POINT, TEST
TP11	3-657-235-00	o	POINT, TEST
TP12	3-657-235-00	o	POINT, TEST
TP13	3-657-235-00	o	POINT, TEST
TP14	3-657-235-00	o	POINT, TEST
TP16	3-657-235-00	o	POINT, TEST
X1	1-527-231-00	s	OSCILLATOR, CRYSTAL 4.433618MHz

DU-58 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-611-954-11	o	PRINTED CIRCUIT BOARD, DU-58

DUS-3 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
			All of the component parts on the DUS-3 board are supplied together when you order AU-51A board.
1pc	1-611-961-11	o	PRINTED CIRCUIT BOARD, DUS-3
LV301	1-407-293-00	s	VAR, 1.5mH

DUS-4 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-611-963-11	o	PC BOARD, DUS-4
S1	1-570-816-11	s	SWITCH, REED

DUS-5 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-611-964-11	o	PC BOARD, DUS-5
SB1	8-719-919-10	s	55M22LS

DUS-6 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-611-965-11	o	PRINTED CIRCUIT BOARD, DUS-6
RV1	1-230-553-11	s	RES, VAR, CARBON 100K "TRACKING"

DUS-33 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
			All of the component parts on the DUS-3 board are supplied together when you order AU-51A board.
1pc	1-613-317-11	o	PRINTED CIRCUIT BOARD, DUS-3
LV301	1-407-293-00	s	VAR, 1.5mH
LV302	1-407-293-00	s	VAR, 1.5mH

DUS-69 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-615-689-11	o	PRINTED CIRCUIT BOARD, DUS-69
RV1	1-237-790-21	s	RES, ADJ, CARBON 10K "EARPHONE LEVEL"

DUS-70 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-615-977-11	o	PRINTED CIRCUIT BOARD, DUS-70
R1	1-215-394-00	s	RES, METAL FILM (SMALL TYPE) 75

Note: For the # marked in the followig parts list refer to Section 18 "CHANGED PARTS"

DUS-94 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
	All of the component parts on the DUS-94 board are supplied together when you order AU-64A board or AU-65A board.		
2pcs	1-615-980-11	o	PRINTED CIRCUIT BOARD, DUS-94
LV1	1-459-434-00	s	COIL, VARIABLE 22mH

IF-99 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
	All of the component parts on the IF-99 board are supplied together when you order VO-12 board.		
1pc	1-616-334-11	o	PRINTED CIRCUIT BOARD, IF-99
C601	1-161-059-00	s	CERAMIC 0.047uF 10% 50V
C602	1-161-059-00	s	CERAMIC 0.047uF 10% 50V
E601	3-657-235-00	o	POINT, TEST
E602	3-657-235-00	o	POINT, TEST
E603	3-657-235-00	o	POINT, TEST
E604	3-657-235-00	o	POINT, TEST
IC601	8-752-006-00	s	IC CX20060 (SONY)
R601	1-249-433-11	s	CARBON 22K 5% 1/4W
R602	1-249-432-11	s	CARBON 18K 55 1/4W
TP602	3-657-235-00	o	POINT, TEST
TP603	3-657-235-00	o	POINT, TEST
TP604	3-657-235-00	o	POINT, TEST
TP605	3-657-235-00	o	POINT, TEST
TP606	3-657-235-00	o	POINT, TEST
TP607	3-657-235-00	o	POINT, TEST

KY-86 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6717-404-A	o	MOUNTED CIRCUIT BOARD, KY-86
4pcs	1-535-366-21	o	CONTACT
2pcs	1-562-153-11	o	HOUSING, CONNECTOR 8P
2pcs	1-562-157-11	o	HOUSING, CONNECTOR 12P
2pcs	1-569-207-11	o	HOUSING, CONNECTOR 14P

(KY-86 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
#1pc	1-807-338-11	s	DISPLAY PANEL, LIQUID CRYSTAL
3pcs	3-694-741-01	o	HOLDER (C), LED
1pc	3-686-064-03	s	HOLDER, LCD
3pcs	7-628-253-95	s	SCREW +PS 2.6X4
1pc	7-623-421-07	s	LW 2.6, TYPE B
C2	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C3	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C5	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C7	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C8	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C9	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C10	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C13	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C14	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C15	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C16	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C17	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C21	1-163-239-11	s	CERAMIC 33PF 5% 50V
C22	1-163-239-11	s	CERAMIC 33PF 5% 50V
C28	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C29	1-131-381-00	s	TANTALUM 47uF 10% 6.3V
C30	1-126-157-11	s	ELECT 10uF 20% 16V
C31	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C32	1-126-153-11	s	ELECT 22uF 20% 6.3V
C33	1-126-153-11	s	ELECT 22uF 20% 6.3V
C34	1-126-157-11	s	ELECT 10uF 20% 16V
C35	1-163-034-00	s	CERAMIC 0.033uF 50V
C36	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C37	1-163-243-11	s	CERAMIC 47PF 5% 50V
C38	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C39	1-126-160-11	s	ELECT 1uF 20% 50V
C40	1-124-257-00	s	ELECT 2.2uF 20% 50V
C41	1-162-710-11	s	CERAMIC 100PF 5% 50V
C42	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C43	1-163-038-00	s	CERAMIC 0.1uF 25V
C44	1-163-038-00	s	CERAMIC 0.1uF 25V
C45	1-163-005-11	s	CERAMIC 470PF 10% 50V
C46	1-163-005-11	s	CERAMIC 470PF 10% 50V
C47	1-131-347-00	s	TANTALUM 1uF 10% 25V
C48	1-163-038-00	s	CERAMIC 0.1uF 25V
C49	1-163-035-00	s	CERAMIC 0.047uF 50V
C50	1-163-035-00	s	CERAMIC 0.047uF 50V
#C60	1-163-037-00	s	CERAMIC 0.022uF 10% 25V
CN303	1-562-939-11	o	CONNECTOR, BECON 36P
CN305	1-564-005-11	o	PIN, CONNECTOR 6P
CN306	1-506-468-11	s	PIN, CONNECTOR 3P
CN307	1-506-468-11	s	PIN, CONNECTOR 3P
CN308	1-506-468-11	s	PIN, CONNECTOR 3P
D1	8-719-955-05	s	DIODE BR5505S
D2	8-719-955-05	s	DIODE BR5505S
D3	8-719-955-05	s	DIODE BR5505S
D4	8-719-955-05	s	DIODE BR5505S
D5	8-719-955-05	s	DIODE BR5505S

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(KY-86 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D6	8-719-955-05	s	DIODE BR5505S
D7	8-719-955-05	s	DIODE BR5505S
D8	8-719-955-05	s	DIODE BR5505S
D9	8-719-955-05	s	DIODE BR5505S
D10	8-719-955-05	s	DIODE BR5505S
D11	8-719-955-05	s	DIODE BR5505S
D12	8-719-800-76	s	DIODE 1SS226
D13	8-719-800-76	s	DIODE 1SS226
D14	8-719-800-76	s	DIODE 1SS226
D15	8-719-800-76	s	DIODE 1SS226
D16	8-719-800-76	s	DIODE 1SS226
IC1	8-759-938-45	s	IC MSM58421A-74GS-K (OKI)
IC2	8-759-201-05	s	IC TC4056BF (TOSHIBA)
IC3	8-759-200-83	s	IC TC4071BF (TOSHIBA)
IC4	8-759-200-92	s	IC TC5012BF (TOSHIBA)
IC5	8-759-008-79	s	IC MC14011BF (MOTOROLA)
IC7	8-759-100-96	s	IC NJM4558M (JRC)
IC8	8-759-009-05	s	IC MC14051BF (MOTOROLA)
IC9	8-759-200-92	s	IC TC5012BF (TOSHIBA)
IC10	8-759-805-49	s	IC CXK5816M-15L (SONY)
IC11	8-759-200-92	s	IC TC5012BF (TOSHIBA)
#IC12	8-759-925-83	s	IC SN74HC27ANS (TI)
#IC13	8-759-927-46	s	IC SN74HC00ANS (TI)
#IC14	8-759-927-46	s	IC SN74HC00ANS (TI)
IC15	8-759-200-90	s	IC TC4538BF (TOSHIBA)
IC16	8-759-200-67	s	IC TC4001BF (TOSHIBA)
IC17	8-759-009-10	s	IC MC14069UBF (MOTOROLA)
PL1	1-518-566-11	s	LAMP, PILOT "FOR METER CH-1"
PL2	1-518-566-11	s	LAMP, PILOT "FOR METER CH-2"
Q1	8-729-320-62	s	TRANSISTOR 2SD789-34
Q2	8-729-901-00	s	TRANSISTOR DTC124EK
Q3	8-729-901-01	s	TRANSISTOR DTC144EK
Q4	8-729-901-01	s	TRANSISTOR DTC144EK
Q6	8-729-900-52	s	TRANSISTOR DTC114YK
Q7	8-729-900-52	s	TRANSISTOR DTC114YK
Q8	8-729-900-52	s	TRANSISTOR DTC114YK
Q9	8-729-900-52	s	TRANSISTOR DTC114YK
Q10	8-729-900-52	s	TRANSISTOR DTC114YK
Q11	8-729-900-52	s	TRANSISTOR DTC114YK
#Q12	8-729-900-52	s	TRANSISTOR DTC114YK
#Q13	8-729-900-52	s	TRANSISTOR DTC114YK
#Q14	8-729-900-52	s	TRANSISTOR DTC114YK
Q15	8-729-900-52	s	TRANSISTOR DTC114YK
Q16	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q17	8-729-901-46	s	TRANSISTOR DTA114YK
Q18	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q19	8-729-901-01	s	TRANSISTOR DTC144EK
Q20	8-729-901-01	s	TRANSISTOR DTC144EK
Q21	8-729-901-01	s	TRANSISTOR DTC144EK
Q22	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
#R2	1-216-073-00	s	METAL 10K 5% 1/10W
R3	1-216-073-00	s	METAL 10K 5% 1/10W
R4	1-216-073-00	s	METAL 10K 5% 1/10W
R5	1-216-073-00	s	METAL 10K 5% 1/10W
R6	1-216-041-00	s	METAL 470 5% 1/10W

(KY-86 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R7	1-216-073-00	s	METAL 10K 5% 1/10W
R10	1-216-033-00	s	METAL 220 5% 1/10W
R11	1-216-033-00	s	METAL 220 5% 1/10W
R12	1-216-033-00	s	METAL 220 5% 1/10W
R13	1-216-033-00	s	METAL 220 5% 1/10W
R14	1-216-033-00	s	METAL 220 5% 1/10W
R15	1-216-033-00	s	METAL 220 5% 1/10W
R16	1-216-073-00	s	METAL 10K 5% 1/10W
R17	1-216-073-00	s	METAL 10K 5% 1/10W
R18	1-216-073-00	s	METAL 10K 5% 1/10W
R19	1-216-073-00	s	METAL 10K 5% 1/10W
R20	1-216-073-00	s	METAL 10K 5% 1/10W
R21	1-216-073-00	s	METAL 10K 5% 1/10W
R22	1-216-025-00	s	METAL 100 5% 1/10W
R23	1-216-073-00	s	METAL 10K 5% 1/10W
R25	1-216-065-00	s	METAL 4.7K 5% 1/10W
R26	1-216-065-00	s	METAL 4.7K 5% 1/10W
R27	1-216-065-00	s	METAL 4.7K 5% 1/10W
R28	1-216-041-00	s	METAL 470 5% 1/10W
R29	1-216-041-00	s	METAL 470 5% 1/10W
R30	1-216-041-00	s	METAL 470 5% 1/10W
R31	1-216-041-00	s	METAL 470 5% 1/10W
R32	1-216-041-00	s	METAL 470 5% 1/10W
R33	1-216-065-00	s	METAL 4.7K 5% 1/10W
R34	1-216-065-00	s	METAL 4.7K 5% 1/10W
R36	1-216-025-00	s	METAL 100 5% 1/10W
R37	1-216-073-00	s	METAL 10K 5% 1/10W
R38	1-216-097-00	s	METAL 100K 5% 1/10W
R39	1-216-049-00	s	METAL 1K 5% 1/10W
R40	1-216-073-00	s	METAL 10K 5% 1/10W
R41	1-216-073-00	s	METAL 10K 5% 1/10W
R42	1-216-097-00	s	METAL 100K 5% 1/10W
R46	1-216-049-00	s	METAL 1K 5% 1/10W
#R50	1-249-414-11	s	CARBON 560 5% 1/4W
#R51	1-249-414-11	s	CARBON 560 5% 1/4W
#R52	1-249-414-11	s	CARBON 560 5% 1/4W
#R53	1-249-414-11	s	CARBON 560 5% 1/4W
#R54	1-249-414-11	s	CARBON 560 5% 1/4W
#R55	1-249-414-11	s	CARBON 560 5% 1/4W
#R56	1-249-414-11	s	CARBON 560 5% 1/4W
#R57	1-249-414-11	s	CARBON 560 5% 1/4W
#R58	1-249-414-11	s	CARBON 560 5% 1/4W
#R59	1-249-414-11	s	CARBON 560 5% 1/4W
R60	1-216-065-00	s	METAL 4.7K 5% 1/10W
R61	1-216-065-00	s	METAL 4.7K 5% 1/10W
R62	1-216-065-00	s	METAL 4.7K 5% 1/10W
R63	1-216-065-00	s	METAL 4.7K 5% 1/10W
R64	1-216-065-00	s	METAL 4.7K 5% 1/10W
R65	1-216-065-00	s	METAL 4.7K 5% 1/10W
R66	1-216-065-00	s	METAL 4.7K 5% 1/10W
R77	1-216-057-00	s	METAL 2.2K 5% 1/10W
R78	1-216-057-00	s	METAL 2.2K 5% 1/10W
R79	1-216-093-00	s	METAL 68K 5% 1/10W
R80	1-216-093-00	s	METAL 68K 5% 1/10W
R81	1-216-097-00	s	METAL 100K 5% 1/10W

Note: For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS."

(KY-86 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R82	1-216-105-00	s	METAL 220K 5% 1/10W
R83	1-216-109-00	s	METAL 330K 5% 1/10W
R84	1-216-081-00	s	METAL 22K 5% 1/10W
R85	1-216-097-00	s	METAL 100K 5% 1/10W
R86	1-216-089-91	s	METAL 47K 5% 1/10W
R87	1-216-049-00	s	METAL 1K 5% 1/10W
R88	1-216-029-00	s	METAL 150 5% 1/10W
R89	1-216-049-00	s	METAL 1K 5% 1/10W
R90	1-216-073-00	s	METAL 10K 5% 1/10W
R91	1-216-081-00	s	METAL 22K 5% 1/10W
R92	1-216-081-00	s	METAL 22K 5% 1/10W
R93	1-247-700-11	s	CARBON 100 5% 1/4W
R94	1-247-700-11	s	CARBON 100 5% 1/4W
R95	1-216-073-00	s	METAL 10K 5% 1/10W
R96	1-216-121-00	s	METAL 1M 5% 1/10W
R97	1-216-049-00	s	METAL 1K 5% 1/10W
R98	1-216-073-00	s	METAL 10K 5% 1/10W
R99	1-216-049-00	s	METAL 1K 5% 1/10W
R100	1-216-065-00	s	METAL 4.7K 5% 1/10W
R101	1-216-033-00	s	METAL 220 5% 1/10W
R102	1-216-033-00	s	METAL 220 5% 1/10W
R103	1-216-033-00	s	METAL 220 5% 1/10W
R104	1-216-033-00	s	METAL 220 5% 1/10W
R105	1-216-073-00	s	METAL 10K 5% 1/10W
R106	1-216-073-00	s	METAL 10K 5% 1/10W
R107	1-216-073-00	s	METAL 10K 5% 1/10W
R108	1-216-073-00	s	METAL 10K 5% 1/10W
R109	1-216-065-00	s	METAL 4.7K 5% 1/10W
R110	1-216-089-91	s	METAL 47K 5% 1/10W
R111	1-216-089-91	s	METAL 47K 5% 1/10W
R112	1-216-089-91	s	METAL 47K 5% 1/10W
R113	1-216-089-91	s	METAL 47K 5% 1/10W
R114	1-216-033-00	s	METAL 220 5% 1/10W
R115	1-216-033-00	s	METAL 220 5% 1/10W
R116	1-216-033-00	s	METAL 220 5% 1/10W
R117	1-216-033-00	s	METAL 220 5% 1/10W
R118	1-216-065-00	s	METAL 4.7K 5% 1/10W
R119	1-216-097-00	s	METAL 100K 5% 1/10W
R120	1-216-065-00	s	METAL 4.7K 5% 1/10W
R121	1-216-097-00	s	METAL 100K 5% 1/10W
R122	1-216-049-00	s	METAL 1K 5% 1/10W
R123	1-216-049-00	s	METAL 1K 5% 1/10W
R124	1-216-121-00	s	METAL 1M 5% 1/10W
R125	1-216-049-00	s	METAL 1K 5% 1/10W
R126	1-216-121-00	s	METAL 1M 5% 1/10W
R127	1-216-121-00	s	METAL 1M 5% 1/10W
R128	1-216-073-00	s	METAL 10K 5% 1/10W
R129	1-216-073-00	s	METAL 10K 5% 1/10W
R130	1-216-105-00	s	METAL 220K 5% 1/10W
R131	1-216-049-00	s	METAL 1K 5% 1/10W
R132	1-216-121-00	s	METAL 1M 5% 1/10W
R133	1-216-049-00	s	METAL 1K 5% 1/10W
R134	1-216-121-00	s	METAL 1M 5% 1/10W
R135	1-216-049-00	s	METAL 1K 5% 1/10W
R136	1-216-121-00	s	METAL 1M 5% 1/10W

(KY-86 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R137	1-216-121-00	s	METAL 1M 5% 1/10W
R138	1-216-105-00	s	METAL 220K 5% 1/10W
R139	1-216-097-00	s	METAL 100K 5% 1/10W
R140	1-216-097-00	s	METAL 100K 5% 1/10W
R141	1-216-073-00	s	METAL 10K 5% 1/10W
R142	1-216-073-00	s	METAL 10K 5% 1/10W
R143	1-216-073-00	s	METAL 10K 5% 1/10W
R144	1-216-073-00	s	METAL 10K 5% 1/10W
R145	1-216-073-00	s	METAL 10K 5% 1/10W
R146	1-216-073-00	s	METAL 10K 5% 1/10W
#R147	1-247-895-00	s	CARBON 470K 5% 1/4W
RV1	1-230-894-11	s	RES, VAR, CARBON 10K "AUDIO CH-1 REC LEVEL"
RV2	1-230-894-11	s	RES, VAR, CARBON 10K "AUDIO CH-2 REC LEVEL"
S1	1-554-303-21	s	SWITCH, KEY BOARD "RESET"
S2	1-570-845-11	s	SWITCH, SLIDE "CTL/TC"
S3	1-570-845-11	s	SWITCH, SLIDE "LIGHT"
S4	1-554-263-11	s	SWITCH, KEY "STOP"
S5	1-554-263-11	s	SWITCH, KEY "PLAY"
S6	1-553-739-21	s	SWITCH, KEY BOARD "FF"
S7	1-553-739-21	s	SWITCH, KEY BOARD "REW"
S8	1-554-263-11	s	SWITCH, KEY "REC"
S9	1-553-739-21	s	SWITCH, KEY BOARD "DUB"
S10	1-553-739-21	s	SWITCH, KEY BOARD "PAUSE"
S11	1-554-377-21	s	SWITCH, SLIDE "INHIBIT"
X1	1-567-170-00	s	OSCILLATOR, CERAMIC 4.194MHz

LE-20 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-611-956-11	o	PRINTED CIRCUIT BOARD, LE-20
D1	8-719-900-07	s	DIODE KL1

LE-21 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-611-957-11	o	PRINTED CIRCUIT BOARD, LE-21

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

PA-48 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
			All of the component parts on the PA-48 board are supplied together when you order PSB-4 board.
C701	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C702	1-130-485-00	s	MYLAR 0.015uF 5% 50V
C703	1-124-234-00	s	ELECT 22uF 20% 10V
C704	1-124-589-11	s	ELECT 47uF 20% 16V
C705	1-124-589-11	s	ELECT 47uF 20% 16V
C706	1-124-463-00	s	ELECT 0.1uF 20% 50V
C707	1-126-157-11	s	ELECT 10uF 20% 16V
CN752	1-506-468-11	s	PIN, CONNECTOR 3P
D701	8-759-982-02	s	IC RC4562DD(RAYTHEON)
Q701	8-729-620-02	s	TRANSISTOR 2SA1115-F
Q702	8-729-620-02	s	TRANSISTOR 2SA1115-F
Q703	8-729-119-78	s	TRANSISTOR 2SC403SP-5
R701	1-247-843-31	s	CARBON 3.3K 5% 1/4W
R702	1-247-843-31	s	CARBON 3.3K 5% 1/4W
R703	1-247-891-00	s	CARBON 330K 5% 1/4W
R704	1-249-418-11	s	CARBON 1.2K 5% 1/4W
R705	1-249-403-11	s	CARBON 68 5% 1/4W
R706	1-249-417-11	s	CARBON 1K 5% 1/4W
R707	1-249-417-11	s	CARBON 1K 5% 1/4W
R708	1-247-883-00	s	CARBON 150K 5% 1/4W
R709	1-247-706-11	s	CARBON 330 5% 1/4W
R710	1-247-706-11	s	CARBON 330 5% 1/4W
R711	1-249-437-11	s	CARBON 47K 5% 1/4W
R712	1-249-437-11	s	CARBON 47K 5% 1/4W
R713	1-249-437-11	s	CARBON 47K 5% 1/4W
R714	1-249-441-11	s	CARBON 100K 5% 1/4W
R715	1-249-441-11	s	CARBON 100K 5% 1/4W
R716	1-249-441-11	s	CARBON 100K 5% 1/4W
#R717	1-249-417-11	s	CARBON 1K 5% 1/4W
#R718	1-249-441-11	s	CARBON 100K 5% 1/4W
TP701	3-657-703-01	s	TERMINAL, TP
TP702	3-657-703-01	s	TERMINAL, TP

PC-22 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
2pcs	1-611-960-11	o	PC BOARD, PC-22
IC1	8-719-800-81	s	TLP801A (TOSHIBA)
R1	1-249-417-11	s	CARBON (SMALL) 1K
R2	1-247-855-31	s	CARBON (SMALL) 10K

PSB-4 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	⚠A-6723-281-A	o	MOUNTED CIRCUIT BOARD, PSB-4
7pcs	1-535-366-21	o	CONTACT
1pc	9-910-999-31	o	CONNECTOR
1pc	1-561-727-11	o	HOUSING, CONNECTOR 4P
1pc	1-561-732-11	o	HOUSING, CONNECTOR 10P
5pcs	1-562-148-11	o	HOUSING, CONNECTOR 3P
1pc	1-562-149-11	o	HOUSING, CONNECTOR 4P
1pc	1-562-151-11	o	HOUSING, CONNECTOR 6P
2pcs	1-562-155-11	o	HOUSING, CONNECTOR 10P
1pc	3-694-704-01	o	SPACER
1pc	3-694-705-01	o	PIN, SPACER
2pcs	1-533-037-XX	s	HOLDER, FUSE
1pc	1-560-999-11	s	CONNECTOR (WITH DC SW) 4P
2pcs	2-832-007-00	s	BUSHING (K), INSULATING
2pcs	3-660-978-00	s	SHEET, HEAT RESISTING
1pc	3-682-918-00	o	SPACER (A), XLR
1pc	3-686-053-01	o	SHEET, INSULATING, HEAT SINK
3pcs	7-621-770-67	s	SCREW +B 2.6×6
1pc	7-623-421-07	s	LW 2.6, TYPE B
1pc	7-621-770-67	s	SCREW +B 2.6×6
2pcs	7-627-556-97	s	SCREW,PRECISION +P2.6×8 TYPE 1
2pcs	3-701-947-19	s	LABEL (T6.3A), FUSE
1pc	3-694-724-01	o	BRACKET (B), DC IN
C1	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C2	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C3	1-124-584-00	s	ELECT 100uF 20% 6.3V
C4	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C5	1-124-584-00	s	ELECT 100uF 20% 6.3V
#C7	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C8	1-124-589-11	s	ELECT 47uF 20% 16V
C13	1-126-157-11	s	ELECT 10uF 20% 16V
C14	1-126-157-11	s	ELECT 10uF 20% 16V
C17	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C18	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C19	1-124-589-11	s	ELECT 47uF 20% 16V
C20	1-124-589-11	s	ELECT 47uF 20% 16V
#C21	1-124-236-00	s	ELECT 47uF 20% 16V
#C22	1-124-236-00	s	ELECT 47uF 20% 16V
C24	1-126-768-11	s	ELECT 2200uF 20% 16V
C25	1-126-768-11	s	ELECT 2200uF 20% 16V
C26	1-124-556-11	s	ELECT 2200uF 20% 16V
C27	1-124-556-11	s	ELECT 2200uF 20% 16V
C28	1-126-157-11	s	ELECT 10uF 20% 16V
C30	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C31	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C32	1-126-154-11	s	ELECT 47uF 20% 6.3V
C34	1-127-531-11	s	ELECTSOLID 33uF 20% 10V
C35	1-127-531-11	s	ELECTSOLID 33uF 20% 10V
C36	1-127-531-11	s	ELECTSOLID 33uF 20% 10V
C37	1-127-499-00	s	ELECTSOLID 22uF 20% 16V
C38	1-124-584-00	s	ELECT 100uF 20% 6.3V
C39	1-124-584-00	s	ELECT 100uF 20% 6.3V
#C40	1-126-768-11	s	ELECT 2200uF 20% 16V

Note: For the # marked in the followig parts list refer to Section 18 "CHANGED PARTS"

(PSB-4 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
#C41	1-124-360-00	s	ELECT 1000uF 20% 16V
C101	1-126-157-11	s	ELECT 10uF 20% 16V
C102	1-124-589-11	s	ELECT 47uF 20% 16V
C103	1-126-157-11	s	ELECT 10uF 20% 16V
C104	1-126-157-11	s	ELECT 10uF 20% 16V
C106	1-124-589-11	s	ELECT 47uF 20% 16V
#C107	1-163-133-00	s	CERAMIC 470PF 5% 50V
C108	1-163-251-11	s	CERAMIC 100PF 5% 50V
C109	1-130-475-00	s	MYLAR 0.0022uF 5% 50V
C110	1-126-157-11	s	ELECT 10uF 20% 16V
C111	1-124-589-11	s	ELECT 47uF 20% 16V
C112	1-124-589-11	s	ELECT 47uF 20% 16V
C113	1-126-157-11	s	ELECT 10uF 20% 16V
C114	1-126-157-11	s	ELECT 10uF 20% 16V
C115	1-126-157-11	s	ELECT 10uF 20% 16V
C116	1-126-157-11	s	ELECT 10uF 20% 16V
C117	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C120	1-163-243-11	s	CERAMIC 47PF 5% 50V
C121	1-126-157-11	s	ELECT 10uF 20% 16V
C122	1-163-038-00	s	CERAMIC 0.1uF 25V
C126	1-163-017-00	s	CERAMIC 0.0047uF 10% 50V
CN702	1-508-904-00	s	CONNECTOR (M) 6P
CN703	1-508-905-00	s	CONNECTOR (M) 8P
CN704	1-506-469-11	s	PIN, CONNECTOR 4P
CN707	1-506-473-11	s	PIN, CONNECTOR 8P
CN708	1-506-473-11	s	PIN, CONNECTOR 8P
CN716	1-506-468-11	s	PIN, CONNECTOR 3P
CN717	1-506-469-11	s	PIN, CONNECTOR 4P
CN718	1-506-468-11	s	PIN, CONNECTOR 3P
CN720	1-564-013-31	s	PIN, CONNECTOR 3P
CN721	1-564-013-21	s	PIN, CONNECTOR 3P
D1	8-719-101-32	s	DIODE RD2.7EL1
D2	8-719-104-34	s	DIODE 1S2835
D3	8-719-101-32	s	DIODE RD2.7EL1
D4	8-719-200-02	s	DIODE 10E2
D5	8-719-109-69	s	DIODE RD3.6E-B
D6	8-719-109-93	s	DIODE RD6.2ES-B2
D7	8-719-101-50	s	DIODE RD5.1E-L2
D8	8-719-109-93	s	DIODE RD6.2ES-B2
D9	8-719-109-93	s	DIODE RD6.2ES-B2
D11	8-719-109-60	s	DIODE RD2.7ES-B2
D12	8-719-910-75	s	DIODE HZ7B2L
D13	8-719-104-34	s	DIODE 1S2835
D14	8-719-104-34	s	DIODE 1S2835
D15	8-719-104-34	s	DIODE 1S2835
D16	8-719-104-34	s	DIODE 1S2835
D17	8-719-104-34	s	DIODE 1S2835
D18	8-719-104-34	s	DIODE 1S28351
#D20	8-719-101-61	s	DIODE RD6.2E-L2
D21	8-719-104-34	s	DIODE 1S2835
D22	8-719-910-15	s	DIODE HZ11C2L
D23	8-719-104-34	s	DIODE 1S2835
D101	8-719-800-76	s	DIODE 1SS123
D102	8-719-800-76	s	DIODE 1SS123
D103	8-719-800-76	s	DIODE 1SS123
DDC1	1-464-528-11	s	CONVERTER UNIT, DC-DC

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(PSB-4 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
#F1	⚠1-532-325-00	s	TIME-LAG
E701	3-657-703-01	o	TERMINAL, TP
IC1	8-759-100-96	s	IC NJM4558M (JRC)
IC2	8-759-100-96	s	IC NJM4558M (JRC)
IC3	8-759-100-96	s	IC NJM4558M (JRC)
IC101	8-759-981-85	s	IC RC4556D (RAYTHEON)
IC102	8-759-103-48	s	IC UPA74HA-F (NEC)
IC103	8-759-208-11	s	IC HD14053BFP (HITACHI)
L101	1-408-096-00	s	INDUCTOR 470UH
Q1	8-729-140-93	s	TRANSISTOR 2SB733-34
Q2	8-729-140-93	s	TRANSISTOR 2SB733-34
Q3	8-729-901-01	s	TRANSISTOR DTC144EK
Q4	8-729-140-93	s	TRANSISTOR 2SB733-34
Q5	8-729-205-32	s	TRANSISTOR 2SB553-Y
Q6	8-729-283-42	s	TRANSISTOR 2SB834
Q7	8-729-205-32	s	TRANSISTOR 2SB553-Y
Q8	8-729-620-02	s	TRANSISTOR 2SA1115-EF
#Q9	8-729-177-43	s	TRANSISTOR 2SD774
Q11	8-729-900-52	s	TRANSISTOR DTC114YK
Q12	8-729-900-52	s	TRANSISTOR DTC114YK
Q13	8-729-900-52	s	TRANSISTOR DTC114YK
Q14	8-729-900-52	s	TRANSISTOR DTC114YK
Q15	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q16	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q17	8-729-900-52	s	TRANSISTOR DTC114YK
Q18	8-729-900-52	s	TRANSISTOR DTC114YK
Q19	8-729-900-52	s	TRANSISTOR DTC114YK
Q20	8-729-900-52	s	TRANSISTOR DTC114YK
Q21	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q22	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q24	8-729-900-52	s	TRANSISTOR DTC114YK
Q25	8-729-900-52	s	TRANSISTOR DTC114YK
Q26	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q27	8-729-901-01	s	TRANSISTOR DTC144EK
Q28	8-729-901-01	s	TRANSISTOR DTC144EK
Q30	8-729-900-52	s	TRANSISTOR DTC114YK
Q101	8-729-140-93	s	TRANSISTOR 2SB733-34
Q102	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q103	8-729-900-52	s	TRANSISTOR DTC114YK
Q104	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q105	8-729-900-52	s	TRANSISTOR DTC114YK
Q106	8-729-901-01	s	TRANSISTOR DTC144EK
Q107	8-729-901-01	s	TRANSISTOR DTC144EK
Q108	8-729-140-93	s	TRANSISTOR 2SB733-34
Q109	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q110	8-729-901-01	s	TRANSISTOR DTC144EK
Q111	8-729-901-01	s	TRANSISTOR DTC144EK
Q112	8-729-901-01	s	TRANSISTOR DTC144EK
Q113	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q114	8-729-800-43	s	TRANSISTOR 2SK152-3
Q115	8-729-901-01	s	TRANSISTOR DTC144EK
Q116	8-729-900-52	s	TRANSISTOR DTC114YK
Q117	8-729-900-52	s	TRANSISTOR DTC114Y

(PSB-4 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R1	1-216-065-00	s	METAL 4.7K 5% 1/10W
R2	1-216-095-00	s	METAL 82K 5% 1/10W
R3	1-216-097-00	s	METAL 100K 5% 1/10W
R4	1-216-001-00	s	METAL 10 5% 1/10W
R5	1-216-001-00	s	METAL 10 5% 1/10W
R6	1-216-049-00	s	METAL 1K 5% 1/10W
R7	1-216-097-00	s	METAL 100K 5% 1/10W
R8	1-216-057-00	s	METAL 2.2K 5% 1/10W
R9	1-216-079-00	s	METAL 18K 5% 1/10W
R10	1-216-081-00	s	METAL 22K 5% 1/10W
R11	1-216-049-00	s	METAL 1K 5% 1/10W
R12	1-216-067-00	s	METAL 5.6K 5% 1/10W
R13	1-216-073-00	s	METAL 10K 5% 1/10W
R34	1-216-065-00	s	METAL 4.7K 5% 1/10W
R35	1-216-063-00	s	METAL 3.9K 5% 1/10W
R37	1-216-097-00	s	METAL 100K 5% 1/10W
R38	1-216-097-00	s	METAL 100K 5% 1/10W
R39	1-216-065-00	s	METAL 4.7K 5% 1/10W
R40	1-216-063-00	s	METAL 3.9K 5% 1/10W
R42	1-216-073-00	s	METAL 10K 5% 1/10W
R43	1-216-089-91	s	METAL 47K 5% 1/10W
R44	1-216-089-91	s	METAL 47K 5% 1/10W
R45	1-216-089-91	s	METAL 47K 5% 1/10W
R46	1-216-097-00	s	METAL 100K 5% 1/10W
R47	1-216-089-91	s	METAL 47K 5% 1/10W
R48	1-216-089-91	s	METAL 47K 5% 1/10W
R49	1-216-097-00	s	METAL 100K 5% 1/10W
R50	1-216-089-91	s	METAL 47K 5% 1/10W
R51	1-216-089-91	s	METAL 47K 5% 1/10W
R52	1-216-089-91	s	METAL 47K 5% 1/10W
R53	1-216-089-91	s	METAL 47K 5% 1/10W
R54	1-216-097-00	s	METAL 100K 5% 1/10W
R55	1-216-089-91	s	METAL 47K 5% 1/10W
R56	1-216-089-91	s	METAL 47K 5% 1/10W
R57	1-216-097-00	s	METAL 100K 5% 1/10W
R58	1-216-097-00	s	METAL 100K 5% 1/10W
R59	1-216-097-00	s	METAL 100K 5% 1/10W
R60	1-216-059-00	s	METAL 2.7K 5% 1/10W
R61	1-216-065-00	s	METAL 4.7K 5% 1/10W
R63	1-216-075-00	s	METAL 12K 5% 1/10W
R64	1-216-081-00	s	METAL 22K 5% 1/10W
R65	1-216-049-00	s	METAL 1K 5% 1/10W
R66	1-216-049-00	s	METAL 1K 5% 1/10W
R68	1-532-605-00	s	LINK
R69	1-532-605-00	s	LINK
R70	1-532-605-00	s	LINK
R73	1-247-700-11	s	CARBON 100 5% 1/4W
R74	1-247-700-11	s	CARBON 100 5% 1/4W
R75	1-247-700-11	s	CARBON 100 5% 1/4W
R76	1-247-700-11	s	CARBON 100 5% 1/4W
R77	1-216-089-91	s	METAL 47K 5% 1/10W
R78	1-216-049-00	s	METAL 1K 5% 1/10W
R80	1-216-073-00	s	METAL 10K 5% 1/10W
R81	1-216-065-00	s	METAL 4.7K 5% 1/10W
R83	1-216-121-00	s	METAL 1M 5% 1/10W

(PSB-4 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R84	1-216-117-00	s	METAL 680K 5% 1/10W
R86	1-216-069-00	s	METAL 6.8K 5% 1/10W
R87	1-216-065-00	s	METAL 4.7K 5% 1/10W
R88	1-216-025-00	s	METAL 100 5% 1/10W
R101	1-216-097-00	s	METAL 100K 5% 1/10W
R102	1-216-089-91	s	METAL 47K 5% 1/10W
R103	1-216-077-00	s	METAL 15K 5% 1/10W
R104	1-216-077-00	s	METAL 15K 5% 1/10W
R105	1-216-081-00	s	METAL 22K 5% 1/10W
R106	1-216-049-00	s	METAL 1K 5% 1/10W
R107	1-216-049-00	s	METAL 1K 5% 1/10W
R108	1-216-067-00	s	METAL 5.6K 5% 1/10W
R109	1-216-073-00	s	METAL 10K 5% 1/10W
R110	1-216-073-00	s	METAL 10K 5% 1/10W
R111	1-216-051-00	s	METAL 1.2K 5% 1/10W
R112	1-216-073-00	s	METAL 10K 5% 1/10W
R113	1-216-049-00	s	METAL 1K 5% 1/10W
R114	1-216-049-00	s	METAL 1K 5% 1/10W
R115	1-216-025-00	s	METAL 100 5% 1/10W
R117	1-216-025-00	s	METAL 100 5% 1/10W
R118	1-216-097-00	s	METAL 100K 5% 1/10W
R119	1-216-097-00	s	METAL 100K 5% 1/10W
R120	1-216-073-00	s	METAL 10K 5% 1/10W
R121	1-216-097-00	s	METAL 100K 5% 1/10W
R122	1-216-097-00	s	METAL 100K 5% 1/10W
R123	1-216-117-00	s	METAL 680K 5% 1/10W
R124	1-216-073-00	s	METAL 10K 5% 1/10W
R125	1-216-065-00	s	METAL 4.7K 5% 1/10W
R126	1-216-051-00	s	METAL 1.2K 5% 1/10W
R127	1-215-459-00	s	METAL 39K 1% 1/4W
R128	1-216-097-00	s	METAL 100K 5% 1/10W
R129	1-216-097-00	s	METAL 100K 5% 1/10W
R130	1-216-049-00	s	METAL 1K 5% 1/10W
R131	1-216-013-00	s	METAL 33 5% 1/10W
R132	1-216-013-00	s	METAL 33 5% 1/10W
R133	1-215-445-00	s	METAL 10K 1% 1/4W
R134	1-216-013-00	s	METAL 33 5% 1/10W
R135	1-216-073-00	s	METAL 10K 5% 1/10W
R140	1-216-073-00	s	METAL 10K 5% 1/10W
R141	1-216-097-00	s	METAL 100K 5% 1/10W
R142	1-216-067-00	s	METAL 5.6K 5% 1/10W
R143	1-216-089-91	s	METAL 47K 5% 1/10W
R144	1-216-081-00	s	METAL 22K 5% 1/10W
R145	1-216-073-00	s	METAL 10K 5% 1/10W
R146	1-216-113-00	s	METAL 470K 5% 1/10W
R147	1-216-093-00	s	METAL 68K 5% 1/10W
R148	1-216-059-00	s	METAL 2.7K 5% 1/10W
R149	1-216-033-00	s	METAL 220 5% 1/10W
R150	1-216-073-00	s	METAL 10K 5% 1/10W
R151	1-216-095-00	s	METAL 82K 5% 1/10W
R152	1-216-097-00	s	METAL 100K 5% 1/10W
R153	1-216-073-00	s	METAL 10K 5% 1/10W
R155	1-216-121-00	s	METAL 1M 5% 1/10W
R156	1-216-121-00	s	METAL 1M 5% 1/10W
R157	1-216-089-91	s	METAL 47K 5% 1/10W
R158	1-216-089-91	s	METAL 47K 5% 1/10W
R159	1-216-089-91	s	METAL 47K 5% 1/10W
R160	1-216-073-00	s	METAL 10K 5% 1/10W

Note: For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(PSB-4 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
RV1	1-230-524-11	s	RES, ADJ, METAL GLAZE 22K
RV2	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
RV3	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
RV4	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
RV6	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
RV102	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K

PR-24 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6711-650-A	o	MOUNTED CIRCUIT BOARD, RP-24
6pcs	3-621-124-00	o	SPACER
C2	1-126-101-11	s	ELECT 100uF 20% 16V
C3	1-163-035-00	s	CERAMIC 0.047uF 50V
C4	1-163-035-00	s	CERAMIC 0.047uF 50V
C5	1-161-059-00	s	CERAMIC 0.047uF 10% 50V
C7	1-124-589-11	s	ELECT 47uF 20% 16V
C8	1-163-035-00	s	CERAMIC 0.047uF 50V
C9	1-163-035-00	s	CERAMIC 0.047uF 50V
C10	1-124-228-11	s	ELECT 22uF 20% 10V
C11	1-124-589-11	s	ELECT 47uF 20% 16V
C12	1-163-035-00	s	CERAMIC 0.047uF 50V
C13	1-124-228-11	s	ELECT 22uF 20% 10V
C14	1-163-035-00	s	CERAMIC 0.047uF 50V
C15	1-124-589-11	s	ELECT 47uF 20% 16V
C16	1-163-035-00	s	CERAMIC 0.047uF 50V
C17	1-163-035-00	s	CERAMIC 0.047uF 50V
C18	1-163-035-00	s	CERAMIC 0.047uF 50V
C19	1-163-035-00	s	CERAMIC 0.047uF 50V
CN631	1-506-471-11	o	PIN, CONNECTOR 6P
CN632	1-506-469-11	s	PIN, CONNECTOR 4P
CN633	1-506-469-11	s	PIN, CONNECTOR 4P
CN634	1-506-468-11	s	PIN, CONNECTOR 3P
CN635	1-506-469-11	s	PIN, CONNECTOR 4P
CP1	1-560-914-00	s	POST, CONNECTOR 2P
CP2	1-560-914-00	s	POST, CONNECTOR 2P
D1	8-719-911-19	s	DIODE 1SS119
E1	3-657-703-01	o	TERMINAL, TP
E2	3-657-703-01	o	TERMINAL, TP
IC1	8-743-731-00	s	IC BX373A (SONY)
IC2	8-743-741-00	s	IC BX374A (SONY)
IC3	8-741-136-10	s	IC BX1361 (SONY)
IC4	8-741-136-10	s	IC BX1361 (SONY)
L1	1-407-169-XX	s	INDUCTOR 100uH
L2	1-407-169-XX	s	INDUCTOR 100uH
L3	1-408-986-21	s	INDUCTOR 270uH
L4	1-407-169-XX	s	INDUCTOR 100uH

(PR-24 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q1	8-729-231-55	s	TRANSISTOR 2SC2878-AB
Q2	8-729-231-55	s	TRANSISTOR 2SC2878-AB
R1	1-215-394-00	s	METAL 75 1% 1/4W
R2	1-215-420-00	s	METAL 910 1% 1/4W
R3	1-215-408-00	s	METAL 300 1% 1/4W
R4	1-249-419-11	s	CARBON 1.5K 5% 1/4W
R6	1-215-376-00	s	METAL 13 1% 1/4W
R7	1-215-376-00	s	METAL 13 1% 1/4W
R8	1-215-376-00	s	METAL 13 1% 1/4W
R9	1-215-376-00	s	METAL 13 1% 1/4W
R10	1-216-043-00	s	METAL 560 5% 1/10W
R11	1-216-043-00	s	METAL 560 5% 1/10W
R12	1-216-081-00	s	METAL 22K 5% 1/10W
R13	1-216-081-00	s	METAL 22K 5% 1/10W
R14	1-216-073-00	s	METAL 10K 5% 1/10W
R15	1-215-457-00	s	METAL 33K 1% 1/4W
R16	1-215-457-00	s	METAL 33K 1% 1/4W
R21	1-216-067-00	s	METAL 5.6K 5% 1/10W
R23	1-216-065-00	s	METAL 4.7K 5% 1/10W
R24	1-249-401-11	s	CARBON 47 5% 1/4W
R25	1-249-401-11	s	CARBON 47 5% 1/4W
#RV1	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV2	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV3	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV4	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV5	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV7	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
S1	1-561-724-00	o	SOCKET, CONNECTOR 2P
S2	1-561-724-00	o	SOCKET, CONNECTOR 2P
T1	1-426-199-11	s	TRANSFORMER, HIGH FREQUENCY
T2	1-426-245-11	s	TRANSFORMER, HIGH FREQUENCY
T3	1-426-245-11	s	TRANSFORMER, HIGH FREQUENCY
T4	1-426-247-11	s	TRANSFORMER, HIGH FREQUENCY
T5	1-426-247-11	s	TRANSFORMER, HIGH FREQUENCY

SV-57C BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6715-265-B	o	MOUNTED CIRCUIT BOARD, SV-57C
1pc	3-686-055-01	o	HEAT SINK
1pc	3-686-056-01	o	SPRING, LEAF
2pcs	7-627-553-18	s	SCREW,PRECISION +P 2×2
C1	1-124-584-00	s	ELECT 100uF 20% 6.3V
C2	1-126-026-11	s	ELECT 470uF 20% 6.3V
C3	1-124-465-00	s	ELECT 0.47uF 20% 50V
C4	1-130-487-00	s	MYLAR 0.022uF 5% 50V
C5	1-124-465-00	s	ELECT 0.47uF 20% 50V
C6	1-130-487-00	s	MYLAR 0.022uF 5% 50V
C7	1-124-465-00	s	ELECT 0.47uF 20% 50V
C8	1-130-487-00	s	MYLAR 0.022uF 5% 50V
C9	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C10	1-130-485-00	s	MYLAR 0.015uF 5% 50V

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C11	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C12	1-124-589-11	s	ELECT 47uF 20% 16V
C13	1-163-243-11	s	CERAMIC 47PF 5% 50V
C14	1-124-234-00	s	ELECT 22uF 20% 10V
C15	1-124-465-00	s	ELECT 0.47uF 20% 50V
C16	1-163-038-00	s	CERAMIC 0.1uF 25V
C17	1-126-157-11	s	ELECT 10uF 20% 16V
C18	1-163-038-00	s	CERAMIC 0.1uF 25V
C19	1-107-164-00	s	MICA 51PF 5% 50V
C22	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
#C23	1-161-474-00	s	CERAMIC 0.022uF 10% 50V
C24	1-163-001-11	s	CERAMIC 220PF 10% 50V
C25	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
#C26	1-130-481-00	s	MYLAR 0.0068uF 5% 50V
C27	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C28	1-164-182-11	s	CERAMIC 0.0033uF 10% 50V
C29	1-131-343-00	s	TANTALUM 0.22uF 10% 35V
C30	1-126-157-11	s	ELECT 10uF 20% 16V
C31	1-126-160-11	s	ELECT 1uF 20% 50V
C32	1-126-160-11	s	ELECT 1uF 20% 50V
C33	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
C34	1-126-157-11	s	ELECT 10uF 20% 16V
C35	1-126-160-11	s	ELECT 1uF 20% 50V
C36	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C37	1-126-160-11	s	ELECT 1uF 20% 50V
C38	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C39	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C40	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C41	1-130-492-11	s	MYLAR 0.056uF 5% 50V
C42	1-130-490-11	s	MYLAR 0.039uF 5% 50V
C43	1-130-491-00	s	MYLAR 0.047uF 5% 50V
C44	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C45	1-130-481-00	s	MYLAR 0.0068uF 5% 50V
#C46	1-130-489-11	s	MYLAR 0.033uF 5% 50V
C47	1-126-160-11	s	ELECT 1uF 20% 50V
C48	1-126-163-11	s	ELECT 4.7uF 20% 16V
C50	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V
#C51	1-130-486-00	s	MYLAR 0.018uF 5% 50V
C52	1-163-011-11	s	CERAMIC 0.0015uF 10% 50V
C53	1-126-160-11	s	ELECT 1uF 20% 50V
C54	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C55	1-126-157-11	s	ELECT 10uF 20% 16V
C56	1-163-019-00	s	CERAMIC 0.0068uF 10% 50V
C57	1-131-341-00	s	TANTALUM 0.1uF 10% 35V
C58	1-163-017-00	s	CERAMIC 0.0047uF 10% 50V
C59	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
C60	1-163-017-00	s	CERAMIC 0.0047uF 10% 50V
C61	1-124-120-11	s	ELECT 220uF 20% 16V
C62	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C63	1-163-019-00	s	CERAMIC 0.0068uF 10% 50V
C64	1-163-019-00	s	CERAMIC 0.0068uF 10% 50V
C65	1-126-160-11	s	ELECT 1uF 20% 50V
C66	1-126-157-11	s	ELECT 10uF 20% 16V
C67	1-130-491-00	s	MYLAR 0.047uF 5% 50V
C68	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V

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Ref. No. or Q'ty	Part No.	SP	Description
C69	1-130-492-11	s	MYLAR 0.056uF 5% 50V
C70	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C71	1-163-017-00	s	CERAMIC 0.0047uF 10% 50V
C72	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
C73	1-126-157-11	s	ELECT 10uF 20% 16V
C74	1-124-120-11	s	ELECT 220uF 20% 16V
C75	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C76	1-124-463-00	s	ELECT 0.1uF 20% 50V
C77	1-163-005-11	s	CERAMIC 470PF 10% 50V
C78	1-163-005-11	s	CERAMIC 470PF 10% 50V
C79	1-130-479-00	s	MYLAR 0.0047uF 5% 50V
C80	1-124-465-00	s	ELECT 0.47uF 20% 50V
C81	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C82	1-124-465-00	s	ELECT 0.47uF 20% 50V
C83	1-130-477-00	s	MYLAR 0.0033uF 5% 50V
C84	1-124-257-00	s	ELECT 2.2uF 20% 35V
C85	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C86	1-124-234-00	s	ELECT 22uF 20% 10V
C87	1-126-153-11	s	ELECT 22uF 20% 6.3V
C88	1-163-038-00	s	CERAMIC 0.1uF 25V
C89	1-124-257-00	s	ELECT 2.2uF 20% 35V
C90	1-124-120-11	s	ELECT 220uF 20% 16V
C91	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C92	1-124-120-11	s	ELECT 220uF 20% 16V
C93	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C94	1-124-120-11	s	ELECT 220uF 20% 16V
C95	1-126-157-11	s	ELECT 10uF 20% 16V
C96	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C97	1-126-154-11	s	ELECT 47uF 20% 6.3V
C98	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C99	1-124-589-11	s	ELECT 47uF 20% 16V
C100	1-126-157-11	s	ELECT 10uF 20% 16V
C101	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C102	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C103	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C104	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C105	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V
C106	1-163-023-00	s	CERAMIC 0.015uF 10% 50V
C107	1-126-157-11	s	ELECT 10uF 20% 16V
C108	1-126-157-11	s	ELECT 10uF 20% 16V
C109	1-163-001-11	s	CERAMIC 220PF 10% 50V
C110	1-126-157-11	s	ELECT 10uF 20% 16V
C111	1-124-584-00	s	ELECT 100uF 20% 6.3V
#C112	1-163-003-00	s	CERAMIC 330PF 10% 50V
C113	1-124-584-00	s	ELECT 100uF 20% 6.3V
C114	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C115	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C116	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C117	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C118	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C119	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C120	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C121	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C122	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C123	1-163-243-11	s	CERAMIC 47PF 5% 50V

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C124	1-163-038-00	s	CERAMIC 0.1uF 25V
C125	1-163-038-00	s	CERAMIC 0.1uF 25V
C126	1-163-038-00	s	CERAMIC 0.1uF 25V
C127	1-163-227-11	s	CERAMIC 10PF 0.5PF 50V
C128	1-163-001-11	s	CERAMIC 220PF 10% 50V
#C130	1-130-486-00	s	MYLAR 0.018uF 5% 50V
CN501	1-506-468-11	s	PIN, CONNECTOR 3P
CN502	1-506-468-11	s	PIN, CONNECTOR 3P
CN503	1-506-468-11	s	PIN, CONNECTOR 3P
CN504	1-564-002-41	s	PIN, CONNECTOR 3P
CN505	1-564-011-11	o	PIN, CONNECTOR 12P
CN506	1-564-007-11	o	PIN, CONNECTOR 8P
CN507	1-564-004-11	o	PIN, CONNECTOR 5P
CN508	1-564-009-11	o	PIN, CONNECTOR 10P
CN509	1-506-469-11	s	PIN, CONNECTOR 4P
CN510	1-506-469-11	s	PIN, CONNECTOR 4P
CN511	1-506-468-11	s	PIN, CONNECTOR 3P
CN512	1-506-473-11	s	PIN, CONNECTOR 8P
CN513	1-506-473-11	s	PIN, CONNECTOR 8P
CN514	1-506-475-11	s	PIN, CONNECTOR 10P
CN515	1-506-468-11	s	PIN, CONNECTOR 3P
D1	8-719-911-19	s	DIODE 1SS119
D2	8-719-911-19	s	DIODE 1SS119
D3	8-719-911-19	s	DIODE 1SS119
D4	8-719-400-18	s	DIODE MA152WK
D6	8-719-800-76	s	DIODE 1SS226
D7	8-719-800-76	s	DIODE 1SS226
D8	8-719-800-76	s	DIODE 1SS226
D10	8-719-104-34	s	DIODE 1S2836
D11	8-719-104-34	s	DIODE 1S2836
D12	8-719-104-34	s	DIODE 1S2836
D13	8-719-911-19	s	DIODE 1SS119
D14	8-719-911-19	s	DIODE 1SS119
D15	8-719-800-76	s	DIODE 1SS226
D16	8-719-800-76	s	DIODE 1SS226
D17	8-719-400-18	s	DIODE MA152WK
D18	8-719-110-13	s	DIODE RD9.1ES-B2
D19	8-719-982-04	s	DIODE ERB81-004
D20	8-719-911-19	s	DIODE 1SS119
D21	8-719-400-18	s	DIODE MA152WK
D22	8-719-400-18	s	DIODE MA152WK
D23	8-719-110-13	s	DIODE RD9.1ES-B2
D24	8-719-982-04	s	DIODE ERB81-004
D25	8-719-800-76	s	DIODE 1SS226
D26	8-719-800-76	s	DIODE 1SS226
D27	8-719-911-19	s	DIODE 1SS119
D28	8-719-400-18	s	DIODE MA152WK
D30	8-719-911-19	s	DIODE 1SS119
D31	8-719-982-04	s	DIODE ERB81-004
D32	8-719-104-34	s	DIODE 1S2836
D33	8-719-911-19	s	DIODE 1SS119
D34	8-719-800-76	s	DIODE 1SS226
D35	8-719-101-76	s	DIODE RD10E-L2
D36	8-719-911-19	s	DIODE 1SS119
D38	8-719-400-18	s	DIODE MA152WK
D39	8-719-400-18	s	DIODE MA152WK

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D40	8-719-104-34	s	DIODE 1S2836
D41	8-719-911-19	s	DIODE 1SS119
D43	8-719-911-19	s	DIODE 1SS119
#D44	8-719-104-34	s	DIODE 1S2836
#D45	8-719-911-19	s	DIODE 1SS119
#IC1	8-751-941-05	s	IC CX194B-5 (SONY)
IC2	8-743-915-10	s	IC BX3915A (SONY)
IC3	8-759-008-79	s	IC MC14011BF (MOTOROLA)
IC4	8-759-200-90	s	IC TC4538BF
IC5	8-759-008-79	s	IC MC14011BF (MOTOROLA)
IC6	8-759-008-79	s	IC MC14011BF (MOTOROLA)
IC7	8-759-009-10	s	IC MC14069UBF (MOTOROLA)
IC8	8-759-009-04	s	IC MC14050BF (MOTOROLA)
IC9	8-759-200-90	s	IC TC4538BF (TOSHIBA)
IC10	8-759-200-90	s	IC TC4538BF (TOSHIBA)
IC11	8-759-200-90	s	IC TC4538BF (TOSHIBA)
IC12	8-759-009-10	s	IC MC14069UBF (MOTOROLA)
IC13	8-759-100-95	s	IC UPC324G2 (NEC)
IC14	8-759-100-95	s	IC UPC324G2 (NEC)
IC15	8-759-100-95	s	IC UPC324G2 (NEC)
IC16	8-759-100-93	s	IC UPC393G2 (NEC)
IC17	8-759-009-10	s	IC MC14069UBF (MOTOROLA)
IC18	8-759-200-67	s	IC TC4001BF (TOSHIBA)
IC19	8-759-100-93	s	IC UPC393G2 (NEC)
IC20	8-759-100-93	s	IC UPC393G2 (NEC)
IC21	8-759-207-74	s	IC TC4030BFHB (TOSHIBA)
IC22	8-759-300-71	s	IC HD14053BFP (HITACHI)
IC23	8-759-300-71	s	IC HD14053BFP (HITACHI)
IC24	8-759-300-71	s	IC HD14053BFP (HITACHI)
IC25	8-759-205-78	s	IC TC504013BF (TOSHIBA)
IC26	8-759-100-93	s	IC UPC393G2 (NEC)
IC27	8-759-300-71	s	IC HD14053BFP (HITACHI)
IC28	8-759-100-96	s	IC UPC4558G2 (NEC)
IC29	8-759-200-90	s	IC TC4538BF (TOSHIBA)
L1	1-459-155-00	s	COIL (WITH CORE) 45uH
L2	1-408-298-21	s	COIL, CHOKE 2mH
L3	1-408-298-21	s	COIL, CHOKE 2mH
L4	1-408-298-21	s	COIL, CHOKE 2mH
Q1	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q2	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q3	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q4	8-729-600-24	s	TRANSISTOR 2SC403SP-51
Q5	8-729-901-06	s	TRANSISTOR DTA144EK
Q6	8-729-901-01	s	TRANSISTOR DTC144EK
Q7	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q8	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q9	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q10	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q11	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q12	8-729-901-01	s	TRANSISTOR DTC144EK
Q13	8-729-901-01	s	TRANSISTOR DTC144EK
Q14	8-729-901-01	s	TRANSISTOR DTC144EK
Q15	8-729-901-06	s	TRANSISTOR DTA144EK

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q16	8-729-216-22	s	TRANSISTOR 2SA1162-G
#Q17	8-729-206-55	s	TRANSISTOR 2SC3072-B
Q18	8-729-216-22	s	TRANSISTOR 2SA1162-G
#Q19	8-729-206-55	s	TRANSISTOR 2SC3072-B
Q20	8-729-901-01	s	TRANSISTOR DTC144EK
Q21	8-729-901-01	s	TRANSISTOR DTC144EK
Q22	8-729-901-01	s	TRANSISTOR DTC144EK
Q23	8-729-901-06	s	TRANSISTOR DTA144EK
Q24	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q25	8-729-200-46		TRANSISTOR 2SD1160
Q26	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q27	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q28	8-729-901-01	s	TRANSISTOR DTC144EK
Q29	8-729-901-01	s	TRANSISTOR DTC144EK
Q30	8-729-901-06	s	TRANSISTOR DTA144EK
Q31	8-729-901-01	s	TRANSISTOR DTC144EK
Q32	8-729-901-06	s	TRANSISTOR DTA144EK
Q33	8-729-216-22	s	TRANSISTOR 2SA1162-G
#Q34	8-729-206-55	s	TRANSISTOR 2SC3072-B
Q35	8-729-216-22	s	TRANSISTOR 2SA1162-G
#Q36	8-729-206-55	s	TRANSISTOR 2SC3072-B
Q37	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q38	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q39	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q40	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q41	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q42	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q43	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q44	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q45	8-729-901-01	s	TRANSISTOR DTC144EK
Q46	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q47	8-729-901-01	s	TRANSISTOR DTC144EK
Q48	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q49	8-729-901-06	s	TRANSISTOR DTA144EK
Q50	8-729-901-06	s	TRANSISTOR DTA144EK
Q51	8-729-901-06	s	TRANSISTOR DTA144EK
Q52	8-729-901-06	s	TRANSISTOR DTA144EK
Q53	8-729-901-01	s	TRANSISTOR DTC144EK
#Q54	8-729-216-22	s	TRANSISTOR 2SA1162-G
R1	1-215-373-31	s	METAL 10 1% 1/4W
R2	1-216-057-00	s	METAL 2.2K 5% 1/10W
R3	1-216-057-00	s	METAL 2.2K 5% 1/10W
R4	1-216-057-00	s	METAL 2.2K 5% 1/10W
R5	1-216-073-00	s	METAL 10K 5% 1/10W
R6	1-216-073-00	s	METAL 10K 5% 1/10W
R7	1-216-073-00	s	METAL 10K 5% 1/10W
R8	1-216-097-00	s	METAL 100K 5% 1/10W
R9	1-216-049-00	s	METAL 1K 5% 1/10W
R10	1-216-077-00	s	METAL 15K 5% 1/10W
R11	1-216-013-00	s	METAL 33 5% 1/10W
R12	1-216-049-00	s	METAL 1K 5% 1/10W
R13	1-216-065-00	s	METAL 4.7K 5% 1/10W
R14	1-216-101-00	s	METAL 150K 5% 1/10W
R15	1-216-101-00	s	METAL 150K 5% 1/10W

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Ref. No. or Q'ty	Part No.	SP	Description
R16	1-216-077-00	s	METAL 15K 5% 1/10W
R17	1-216-073-00	s	METAL 10K 5% 1/10W
R18	1-216-065-00	s	METAL 4.7K 5% 1/10W
R19	1-216-065-00	s	METAL 4.7K 5% 1/10W
R20	1-216-089-91	s	METAL 47K 5% 1/10W
R21	1-216-089-91	s	METAL 47K 5% 1/10W
R22	1-216-081-00	s	METAL 22K 5% 1/10W
R23	1-216-081-00	s	METAL 22K 5% 1/10W
R24	1-216-061-00	s	METAL 3.3K 5% 1/10W
R25	1-216-097-00	s	METAL 100K 5% 1/10W
R26	1-216-097-00	s	METAL 100K 5% 1/10W
#R27	1-216-065-00	s	METAL 4.7K 5% 1/10W
#R28	1-216-079-00	s	METAL 18K 5% 1/10W
R29	1-216-073-00	s	METAL 10K 5% 1/10W
R30	1-216-121-00	s	METAL 1M 5% 1/10W
R31	1-216-073-00	s	METAL 10K 5% 1/10W
R32	1-216-073-00	s	METAL 10K 5% 1/10W
R33	1-216-091-00	s	METAL 56K 5% 1/10W
R34	1-216-073-00	s	METAL 10K 5% 1/10W
R35	1-216-105-00	s	METAL 220K 5% 1/10W
R36	1-249-441-11	s	CARBON 100K 5% 1/4W
R37	1-216-065-00	s	METAL 4.7K 5% 1/10W
R38	1-216-073-00	s	METAL 10K 5% 1/10W
R39	1-216-073-00	s	METAL 10K 5% 1/10W
R40	1-216-073-00	s	METAL 10K 5% 1/10W
R41	1-216-101-00	s	METAL 150K 5% 1/10W
R42	1-216-057-00	s	METAL 2.2K 5% 1/10W
R43	1-216-105-00	s	METAL 220K 5% 1/10W
R44	1-216-049-00	s	METAL 1K 5% 1/10W
R45	1-216-073-00	s	METAL 10K 5% 1/10W
R46	1-216-105-00	s	METAL 220K 5% 1/10W
R47	1-216-073-00	s	METAL 10K 5% 1/10W
R48	1-216-049-00	s	METAL 1K 5% 1/10W
R49	1-216-049-00	s	METAL 1K 5% 1/10W
R50	1-216-097-00	s	METAL 100K 5% 1/10W
R51	1-216-073-00	s	METAL 10K 5% 1/10W
R52	1-216-105-00	s	METAL 220K 5% 1/10W
R53	1-216-073-00	s	METAL 10K 5% 1/10W
R54	1-216-105-00	s	METAL 220K 5% 1/10W
R55	1-216-073-00	s	METAL 10K 5% 1/10W
R56	1-216-049-00	s	METAL 1K 5% 1/10W
R57	1-216-073-00	s	METAL 10K 5% 1/10W
R58	1-216-105-00	s	METAL 220K 5% 1/10W
R59	1-216-073-00	s	METAL 10K 5% 1/10W
R60	1-216-081-00	s	METAL 22K 5% 1/10W
R61	1-216-085-00	s	METAL 33K 5% 1/10W
R62	1-216-073-00	s	METAL 10K 5% 1/10W
R63	1-216-113-00	s	METAL 470K 5% 1/10W
R64	1-216-121-00	s	METAL 1M 5% 1/10W
R65	1-216-121-00	s	METAL 1M 5% 1/10W
R66	1-216-121-00	s	METAL 1M 5% 1/10W
R68	1-216-041-00	s	METAL 470 5% 1/10W
R69	1-216-113-00	s	METAL 470K 5% 1/10W
R70	1-216-089-91	s	METAL 47K 5% 1/10W
R71	1-216-089-91	s	METAL 47K 5% 1/10W

Note: For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R72	1-216-025-00	s	METAL 100 5% 1/10W
R73	1-215-483-00	s	METAL 390K 1% 1/4W
R74	1-216-073-00	s	METAL 10K 5% 1/10W
R75	1-216-065-00	s	METAL 4.7K 5% 1/10W
R77	1-216-101-00	s	METAL 150K 5% 1/10W
R78	1-216-689-11	s	METAL 39K 5% 1/10W
R80	1-216-121-00	s	METAL 1M 5% 1/10W
R81	1-216-121-00	s	METAL 1M 5% 1/10W
R82	1-216-121-00	s	METAL 1M 5% 1/10W
R83	1-216-121-00	s	METAL 1M 5% 1/10W
R84	1-216-091-00	s	METAL 56K 5% 1/10W
R85	1-216-121-00	s	METAL 1M 5% 1/10W
#R86	1-247-895-00	s	CARBON 470K 5% 1/4W
R87	1-216-121-00	s	METAL 1M 5% 1/10W
R88	1-216-121-00	s	METAL 1M 5% 1/10W
R89	1-216-073-00	s	METAL 10K 5% 1/10W
R90	1-216-073-00	s	METAL 10K 5% 1/10W
R91	1-216-097-00	s	METAL 100K 5% 1/10W
R92	1-216-065-00	s	METAL 4.7K 5% 1/10W
R93	1-216-057-00	s	METAL 2.2K 5% 1/10W
R94	1-216-057-00	s	METAL 2.2K 5% 1/10W
R95	1-216-065-00	s	METAL 4.7K 5% 1/10W
R96	1-216-097-00	s	METAL 100K 5% 1/10W
R97	1-216-113-00	s	METAL 470K 5% 1/10W
R98	1-216-081-00	s	METAL 22K 5% 1/10W
R99	1-216-089-91	s	METAL 47K 5% 1/10W
R100	1-216-073-00	s	METAL 10K 5% 1/10W
R101	1-216-053-00	s	METAL 1.5K 5% 1/10W
R102	1-216-049-00	s	METAL 1K 5% 1/10W
R103	1-216-077-00	s	METAL 15K 5% 1/10W
R104	1-216-085-00	s	METAL 33K 5% 1/10W
R105	1-216-089-91	s	METAL 47K 5% 1/10W
R106	1-216-689-11	s	METAL 39K 5% 1/10W
R107	1-216-083-00	s	METAL 27K 5% 1/10W
R108	1-216-105-00	s	METAL 220K 5% 1/10W
R109	1-216-097-00	s	METAL 100K 5% 1/10W
R110	1-216-073-00	s	METAL 10K 5% 1/10W
R111	1-216-073-00	s	METAL 10K 5% 1/10W
R112	1-216-057-00	s	METAL 2.2K 5% 1/10W
R113	1-216-017-00	s	METAL 47 5% 1/10W
R114	1-216-069-00	s	METAL 6.8K 5% 1/10W
R115	1-216-095-00	s	METAL 82K 5% 1/10W
R116	1-216-095-00	s	METAL 82K 5% 1/10W
R117	1-216-025-00	s	METAL 100 5% 1/10W
R118	1-216-097-00	s	METAL 100K 5% 1/10W
R119	1-216-085-00	s	METAL 33K 5% 1/10W
R120	1-216-085-00	s	METAL 33K 5% 1/10W
R121	1-216-089-91	s	METAL 47K 5% 1/10W
R122	1-216-109-00	s	METAL 330K 5% 1/10W
R123	1-216-079-00	s	METAL 18K 5% 1/10W
R124	1-216-041-00	s	METAL 470 5% 1/10W
R125	1-216-073-00	s	METAL 10K 5% 1/10W
R126	1-216-073-00	s	METAL 10K 5% 1/10W
R127	1-216-089-91	s	METAL 47K 5% 1/10W
R128	1-216-077-00	s	METAL 15K 5% 1/10W

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R129	1-216-105-00	s	METAL 220K 5% 1/10W
R130	1-216-085-00	s	METAL 33K 5% 1/10W
R131	1-216-073-00	s	METAL 10K 5% 1/10W
#R132	1-216-117-00	s	METAL 680K 5% 1/10W
R133	1-216-091-00	s	METAL 56K 5% 1/10W
R134	1-216-105-00	s	METAL 220K 5% 1/10W
R135	1-216-117-00	s	METAL 680K 5% 1/10W
R136	1-216-689-11	s	METAL 39K 5% 1/10W
R137	1-216-079-00	s	METAL 18K 5% 1/10W
R138	1-216-073-00	s	METAL 10K 5% 1/10W
R139	1-216-097-00	s	METAL 100K 5% 1/10W
R140	1-216-093-00	s	METAL 68K 5% 1/10W
R141	1-216-089-91	s	METAL 47K 5% 1/10W
R142	1-216-097-00	s	METAL 100K 5% 1/10W
R143	1-216-073-00	s	METAL 10K 5% 1/10W
R144	1-216-073-00	s	METAL 10K 5% 1/10W
R145	1-216-069-00	s	METAL 6.8K 5% 1/10W
R146	1-216-017-00	s	METAL 47 5% 1/10W
R147	1-216-689-11	s	METAL 39K 5% 1/10W
R148	1-216-089-91	s	METAL 47K 5% 1/10W
R149	1-216-041-00	s	METAL 470 5% 1/10W
R150	1-216-097-00	s	METAL 100K 5% 1/10W
R151	1-216-025-00	s	METAL 100 5% 1/10W
R152	1-216-049-00	s	METAL 1K 5% 1/10W
R153	1-216-093-00	s	METAL 68K 5% 1/10W
R154	1-216-105-00	s	METAL 220K 5% 1/10W
R155	1-216-097-00	s	METAL 100K 5% 1/10W
R156	1-216-089-91	s	METAL 47K 5% 1/10W
R157	1-216-073-00	s	METAL 10K 5% 1/10W
R158	1-216-097-00	s	METAL 100K 5% 1/10W
R159	1-249-441-11	s	CARBON 100K 5% 1/4W
R160	1-216-083-00	s	METAL 27K 5% 1/10W
R161	1-216-091-00	s	METAL 56K 5% 1/10W
R162	1-216-085-00	s	METAL 33K 5% 1/10W
R163	1-216-073-00	s	METAL 10K 5% 1/10W
R164	1-216-097-00	s	METAL 100K 5% 1/10W
R165	1-216-073-00	s	METAL 10K 5% 1/10W
R166	1-216-049-00	s	METAL 1K 5% 1/10W
R167	1-247-885-00	s	CARBON 180K 5% 1/4W
R168	1-216-113-00	s	METAL 470K 5% 1/10W
R169	1-216-025-00	s	METAL 100 5% 1/10W
R170	1-216-109-00	s	METAL 330K 5% 1/10W
R172	1-216-097-00	s	METAL 100K 5% 1/10W
R173	1-216-049-00	s	METAL 1K 5% 1/10W
R174	1-216-049-00	s	METAL 1K 5% 1/10W
R175	1-216-049-00	s	METAL 1K 5% 1/10W
R176	1-216-025-00	s	METAL 100 5% 1/10W
R177	1-216-097-00	s	METAL 100K 5% 1/10W
R178	1-216-121-00	s	METAL 1M 5% 1/10W
R179	1-216-097-00	s	METAL 100K 5% 1/10W
R180	1-216-121-00	s	METAL 1M 5% 1/10W
R181	1-216-041-00	s	METAL 470 5% 1/10W
R182	1-216-073-00	s	METAL 10K 5% 1/10W
R183	1-216-113-00	s	METAL 470K 5% 1/10W
R184	1-216-109-00	s	METAL 330K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R185	1-216-089-91	s	METAL 47K 5% 1/10W
R186	1-216-113-00	s	METAL 470K 5% 1/10W
R187	1-216-121-00	s	METAL 1M 5% 1/10W
R189	1-216-041-00	s	METAL 470 5% 1/10W
R191	1-216-113-00	s	METAL 470K 5% 1/10W
R192	1-216-101-00	s	METAL 150K 5% 1/10W
R193	1-216-077-00	s	METAL 15K 5% 1/10W
R194	1-216-073-00	s	METAL 10K 5% 1/10W
R195	1-247-881-00	s	CARBON 120K 5% 1/4W
R196	1-216-085-00	s	METAL 33K 5% 1/10W
R197	1-216-077-00	s	METAL 15K 5% 1/10W
R198	1-216-113-00	s	METAL 470K 5% 1/10W
R199	1-216-081-00	s	METAL 22K 5% 1/10W
R200	1-216-689-11	s	METAL 39K 5% 1/10W
#R201	1-216-104-00	s	METAL 200K 5% 1/10W
R202	1-216-101-00	s	METAL 150K 5% 1/10W
R203	1-216-069-00	s	METAL 6.8K 5% 1/10W
R204	1-216-089-91	s	METAL 47K 5% 1/10W
R205	1-216-109-00	s	METAL 330K 5% 1/10W
#R206	1-216-093-00	s	METAL 68K 5% 1/10W
R207	1-216-105-00	s	METAL 220K 5% 1/10W
R208	1-216-097-00	s	METAL 100K 5% 1/10W
R209	1-216-105-00	s	METAL 220K 5% 1/10W
R210	1-216-073-00	s	METAL 10K 5% 1/10W
#R211	1-216-121-00	s	METAL 1M 5% 1/10W
R212	1-215-478-00	s	METAL 240K 1% 1/4W
R213	1-216-117-00	s	METAL 680K 5% 1/10W
R214	1-216-065-00	s	METAL 4.7K 5% 1/10W
R215	1-216-065-00	s	METAL 4.7K 5% 1/10W
R216	1-216-113-00	s	METAL 470K 5% 1/10W
R217	1-216-105-00	s	METAL 220K 5% 1/10W
R218	1-216-113-00	s	METAL 470K 5% 1/10W
R219	1-216-037-00	s	METAL 330 5% 1/10W
R220	1-216-121-00	s	METAL 1M 5% 1/10W
R221	1-216-085-00	s	METAL 33K 5% 1/10W
R222	1-216-073-00	s	METAL 10K 5% 1/10W
R223	1-216-073-00	s	METAL 10K 5% 1/10W
R224	1-216-061-00	s	METAL 3.3K 5% 1/10W
R225	1-216-017-00	s	METAL 47 5% 1/10W
R227	1-216-097-00	s	METAL 100K 5% 1/10W
R228	1-216-101-00	s	METAL 150K 5% 1/10W
R229	1-216-073-00	s	METAL 10K 5% 1/10W
R230	1-216-073-00	s	METAL 10K 5% 1/10W
R231	1-216-089-91	s	METAL 47K 5% 1/10W
R232	1-216-057-00	s	METAL 2.2K 5% 1/10W
R233	1-216-081-00	s	METAL 22K 5% 1/10W
R234	1-216-089-91	s	METAL 47K 5% 1/10W
R235	1-216-089-91	s	METAL 47K 5% 1/10W
R236	1-216-057-00	s	METAL 2.2K 5% 1/10W
R237	1-216-073-00	s	METAL 10K 5% 1/10W
R238	1-216-081-00	s	METAL 22K 5% 1/10W
R239	1-216-035-00	s	METAL 270 5% 1/10W
R240	1-216-073-00	s	METAL 10K 5% 1/10W
R241	1-216-061-00	s	METAL 3.3K 5% 1/10W
R242	1-216-089-91	s	METAL 47K 5% 1/10W

(SV-57C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R243	1-216-121-00	s	METAL 1M 5% 1/10W
R244	1-216-075-00	s	METAL 12K 5% 1/10W
R245	1-216-073-00	s	METAL 10K 5% 1/10W
R246	1-216-073-00	s	METAL 10K 5% 1/10W
R247	1-216-121-00	s	METAL 1M 5% 1/10W
R248	1-216-121-00	s	METAL 1M 5% 1/10W
#R249	1-216-081-00	s	METAL 22K 5% 1/10W
R250	1-216-081-00	s	METAL 22K 5% 1/10W
R251	1-216-105-00	s	METAL 220K 5% 1/10W
R252	1-216-065-00	s	METAL 4.7K 5% 1/10W
R253	1-216-073-00	s	METAL 10K 5% 1/10W
R254	1-216-073-00	s	METAL 10K 5% 1/10W
R255	1-216-105-00	s	METAL 220K 5% 1/10W
R256	1-207-616-00	s	WIREWOUND 0.47 10% 3W
R258	1-532-675-00	s	LINK
R259	1-532-686-00	s	LINK
R261	1-216-113-00	s	METAL 470K 5% 1/10W
R262	1-216-081-00	s	METAL 22K 5% 1/10W
R263	1-216-097-00	s	METAL 100K 5% 1/10W
R264	1-216-073-00	s	METAL 10K 5% 1/10W
R265	1-216-089-91	s	METAL 47K 5% 1/10W
R266	1-216-097-00	s	METAL 100K 5% 1/10W
R267	1-216-097-00	s	METAL 100K 5% 1/10W
R268	1-216-073-00	s	METAL 10K 5% 1/10W
R269	1-216-057-00	s	METAL 2.2K 5% 1/10W
R270	1-216-041-00	s	METAL 470 5% 1/10W
#R271	1-216-035-00	s	METAL 270 5% 1/10W
R274	1-215-373-31	s	METAL 10 1% 1/4W
R275	1-216-025-00	s	METAL 100 5% 1/10W
R276	1-216-117-00	s	METAL 680K 5% 1/10W
R277	1-216-095-00	s	METAL 82K 5% 1/10W
R278	1-216-065-00	s	METAL 4.7K 5% 1/10W
R279	1-216-081-00	s	METAL 22K 5% 1/10W
R280	1-216-081-00	s	METAL 22K 5% 1/10W
R281	1-216-097-00	s	METAL 100K 5% 1/10W
#R282	1-216-101-00	s	METAL 150K 5% 1/10W
#R283	1-216-295-00	s	METAL 0 5% 1/10W
#R300	1-216-121-00	s	METAL 1M 5% 1/10W
#R301	1-249-425-11	s	CARBON 4.7K 5% 1/4W
#RV1	1-230-527-11	s	RES, ADJ, METAL GLAZE 100K
#RV2	1-230-526-11	s	RES, ADJ, METAL GLAZE 47K
#RV3	1-230-527-11	s	RES, ADJ, METAL GLAZE 100K
#RV4	1-230-526-11	s	RES, ADJ, METAL GLAZE 47K
#RV5	1-230-527-11	s	RES, ADJ, METAL GLAZE 100K
#RV6	1-230-529-11	s	RES, ADJ, METAL GLAZE 470K
#RV7	1-230-526-11	s	RES, ADJ, METAL GLAZE 47K
#RV8	1-230-529-11	s	RES, ADJ, METAL GLAZE 470K
#RV9	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV10	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV11	1-230-526-11	s	RES, ADJ, METAL GLAZE 47K
#RV12	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV13	1-230-527-11	s	RES, ADJ, METAL GLAZE 100K
#RV14	1-230-528-11	s	RES, ADJ, METAL GLAZE 220K
X1	1-567-860-11	s	VIBRATOR, CRYSTAL

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

SWB-4 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-615-967-11	o	PRINTED CIRCUIT BOARD, SWB-4
C1	1-161-021-11	s	CERAMIC 0.047MF 10% 25V
S1	1-570-857-11	s	SWITCH, SLIDE
S2	1-570-851-11	s	SWITCH, SLIDE

SY-18C BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6717-405-A	o	MOUNTED CIRCUIT BOARD, SY-18C
1pc	1-535-366-21	o	CONTACT
1pc	1-561-732-11	o	HOUSING, CONNECTOR 10P
1pc	1-562-155-11	o	HOUSING, CONNECTOR 10P
1pc	1-613-317-11	o	PRINTED CIRCUIT BOARD, DUS-33
2pcs	3-621-124-00		SPACER
C1	1-126-162-11	s	ELECT 3.3uF 20% 50V
C2	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C3	1-131-381-00	s	TANTALUM 47uF 10% 6.3V
C4	1-126-153-11	s	ELECT 22uF 20% 6.3V
C5	1-163-031-11	s	CERAMIC 0.01uF 50V
C6	1-163-035-00	s	CERAMIC 0.047uF 50V
C7	1-163-133-00	s	CERAMIC 470PF 5% 50V
C8	1-131-381-00	s	TANTALUM 47uF 10% 10V
C9	1-126-160-11	s	ELECT 1uF 20% 50V
C10	1-126-157-11	s	ELECT 10uF 20% 6.3V
C11	1-126-160-11	s	ELECT 1uF 20% 50V
C12	1-126-160-11	s	ELECT 1uF 20% 50V
C13	1-163-251-11	s	CERAMIC 100PF 5% 50V
C14	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V
C15	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V
C16	1-163-251-11	s	CERAMIC 100PF 5% 50V
C17	1-163-133-00	s	CERAMIC 470PF 5% 50V
C18	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C19	1-126-157-11	s	ELECT 10uF 20% 16V
C20	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C21	1-126-154-11	s	ELECT 47uF 20% 6.3V
C22	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C23	1-126-157-11	s	ELECT 10uF 20% 6.3V
C26	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C27	1-126-157-11	s	ELECT 10uF 20% 6.3V
C28	1-163-141-00	s	CERAMIC 0.001uF 5% 50V
C29	1-163-141-00	s	CERAMIC 0.001uF 5% 50V
C30	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C31	1-163-239-11	s	CERAMIC 33PF 5% 50V
C32	1-163-239-11	s	CERAMIC 33PF 5% 50V
C33	1-163-235-11	s	CERAMIC 22PF 5% 50V
C34	1-163-235-11	s	CERAMIC 22PF 5% 50V
C35	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C36	1-126-157-11	s	ELECT 10uF 20% 6.3V
C37	1-130-473-00	s	MYLAR 0.0015uF 5% 50V

(SY-18C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C38	1-124-464-11	s	ELECT 0.22uF 20% 50V
C39	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C40	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C41	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C42	1-124-465-00	s	ELECT 0.47uF 20% 50V
C43	1-126-157-11	s	ELECT 10uF 20% 6.3V
C44	1-130-473-00	s	MYLAR 0.0015uF 5% 50V
C45	1-124-464-11	s	ELECT 0.22uF 20% 50V
C46	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C47	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C48	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C49	1-124-465-00	s	ELECT 0.47uF 20% 50V
C50	1-126-160-11	s	ELECT 1uF 20% 50V
C51	1-124-465-00	s	ELECT 0.47uF 20% 50V
C53	1-124-465-00	s	ELECT 0.47uF 20% 50V
C54	1-124-465-00	s	ELECT 0.47uF 20% 50V
C60	1-126-157-11	s	ELECT 10uF 20% 16V
C61	1-126-157-11	s	ELECT 10uF 20% 16V
#C62	1-163-035-00	s	CERAMIC 0.047uF 50V
C101	1-163-035-00	s	CERAMIC 0.047uF 50V
C102	1-163-035-00	s	CERAMIC 0.047uF 50V
C103	1-163-035-00	s	CERAMIC 0.047uF 50V
C104	1-163-035-00	s	CERAMIC 0.047uF 50V
C105	1-163-035-00	s	CERAMIC 0.047uF 50V
C106	1-163-035-00	s	CERAMIC 0.047uF 50V
C107	1-163-035-00	s	CERAMIC 0.047uF 50V
C108	1-163-035-00	s	CERAMIC 0.047uF 50V
C109	1-163-035-00	s	CERAMIC 0.047uF 50V
C110	1-163-035-00	s	CERAMIC 0.047uF 50V
C113	1-163-035-00	s	CERAMIC 0.047uF 50V
C114	1-163-035-00	s	CERAMIC 0.047uF 50V
C115	1-163-035-00	s	CERAMIC 0.047uF 50V
C116	1-163-035-00	s	CERAMIC 0.047uF 50V
C117	1-163-035-00	s	CERAMIC 0.047uF 50V
C121	1-163-035-00	s	CERAMIC 0.047uF 50V
C122	1-163-035-00	s	CERAMIC 0.047uF 50V
C123	1-163-035-00	s	CERAMIC 0.047uF 50V
C124	1-163-035-00	s	CERAMIC 0.047uF 50V
C125	1-124-465-00	s	ELECT 0.47uF 20% 50V
C126	1-124-234-00	s	ELECT 22uF 20% 16V
C127	1-124-465-00	s	ELECT 0.47uF 20% 50V
CN103	1-564-007-11	o	PIN, CONNECTOR 8P
CN106	1-506-475-11	s	PIN, CONNECTOR 10P
CN107	1-564-013-11	o	PIN, CONNECTOR 3P
CN109	1-506-471-11	s	PIN, CONNECTOR 6P
CN115	1-506-470-11	s	PIN, CONNECTOR 5P
CN116	1-506-468-11	s	PIN, CONNECTOR 3P
CN117	1-506-468-11	s	PIN, CONNECTOR 3P
CN118	1-564-002-41	s	PIN, CONNECTOR 3P
CN119	1-564-002-41	s	PIN, CONNECTOR 3P
CN120	1-506-468-11	s	PIN, CONNECTOR 3P
CN121	1-506-471-11	s	PIN, CONNECTOR 6P
#CN122	1-564-002-00	s	PIN, CONNECTOR 3P
CN141	1-506-493-11	s	PIN, CONNECTOR 14P
CN142	1-506-491-11	s	PIN, CONNECTOR 12P
CN143	1-506-491-11	s	PIN, CONNECTOR 12P

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

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Ref. No. or Q'ty	Part No.	SP	Description
CN144	1-506-493-11	s	PIN, CONNECTOR 14P
CN151	1-506-477-11	s	PIN, CONNECTOR 12P
CN152	1-506-477-11	s	PIN, CONNECTOR 12P
CN153	1-506-470-11	s	PIN, CONNECTOR 5P
D1	8-719-400-18	s	DIODE MA152WK
D2	8-719-400-18	s	DIODE MA152WK
D3	8-719-109-93	s	DIODE RD6.2ES-B2
D4	8-719-911-19	s	DIODE 1SS119
D5	8-719-400-18	s	DIODE MA152WK
D6	8-719-400-18	s	DIODE MA152WK
D8	8-719-104-34	s	DIODE 1S2836
D9	8-719-400-18	s	DIODE MA152WK
D10	8-719-911-19	s	DIODE 1SS119
D11	8-719-101-43	s	DIODE RD4.3E-L2
D12	8-719-911-19	s	DIODE 1SS119
D13	8-719-101-32	s	DIODE RD2.7E-L1
D17	8-719-400-18	s	DIODE MA152WK
D18	8-719-400-18	s	DIODE MA152WK
D19	8-719-400-18	s	DIODE MA152WK
D20	8-719-400-18	s	DIODE MA152WK
D23	8-719-911-19	s	DIODE 1SS119
D25	8-719-104-34	s	DIODE 1S2836
D26	8-719-911-19	s	DIODE 1SS119
D27	8-719-911-19	s	DIODE 1SS119
E1	3-657-235-00	o	POINT, TEST
IC1	8-759-983-28	s	IC MB88501-1039M (FUJITSU)
IC2	8-759-983-29	s	IC MB88501-1040M (FUJITSU)
IC3	8-759-205-67	s	IC TC4512BF (TOSHIBA)
IC4	8-759-205-67	s	IC TC4512BF (TOSHIBA)
IC5	8-759-205-67	s	IC TC4512BF (TOSHIBA)
IC6	8-759-205-67	s	IC TC4512BF (TOSHIBA)
IC7	8-759-102-82	s	IC UPD82C43G (NEC)
IC8	8-759-102-82	s	IC UPD82C43G (NEC)
IC9	8-759-913-99	s	IC MB88201-173N (FUJITSU)
IC10	8-759-201-53	s	IC TC40H000F (TOSHIBA)
IC11	8-759-204-20	s	IC TC4024BF (TOSHIBA)
IC12	8-759-008-79	s	IC MC14011BF (MOTOROLA)
IC13	8-759-981-65	s	IC NJM2903M (JRC)
IC14	8-759-981-65	s	IC NJM2903M (JRC)
IC15	8-759-745-64	s	IC NJM4560M (JRC)
IC16	8-759-207-74	s	IC TC4030BFHB (TOSHIBA)
IC17	8-759-981-65	s	IC NJM2903M (JRC)
IC18	8-759-200-90	s	IC TC4538BF (TOSHIBA)
IC19	8-759-200-84	s	IC TC4081BF (TOSHIBA)
IC20	8-759-008-79	s	IC MC14011BF (MOTOROLA)
IC21	8-759-200-84	s	IC TC4081BF (TOSHIBA)
IC22	8-759-200-84	s	IC TC4081BF (TOSHIBA)
IC23	8-759-300-71	s	IC MD14053BFP (HITACHI)
IC24	8-759-200-90	s	IC TC4538BF (TOSHIBA)
L1	1-408-989-21	s	INDUCTOR 470uH
L2	1-408-989-21	s	INDUCTOR 470uH
L3	1-408-974-21	s	INDUCTOR 22uH
Q1	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q2	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q3	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q4	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q5	8-729-901-01	s	TRANSISTOR DTC144EK

(SY-18C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q6	8-729-901-01	s	TRANSISTOR DTC144EK
Q7	8-729-901-01	s	TRANSISTOR DTC144EK
Q8	8-729-901-01	s	TRANSISTOR DTC144EK
Q9	8-729-901-06	s	TRANSISTOR DTA144EK
Q10	8-729-901-01	s	TRANSISTOR DTC144EK
Q11	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q12	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q13	8-729-901-06	s	TRANSISTOR DTA144EK
Q14	8-729-901-01	s	TRANSISTOR DTC144EK
Q15	8-729-901-01	s	TRANSISTOR DTC144EK
Q16	8-729-901-06	s	TRANSISTOR DTA144EK
Q17	8-729-901-01	s	TRANSISTOR DTC144EK
Q18	8-729-901-01	s	TRANSISTOR DTC144EK
Q19	8-729-901-01	s	TRANSISTOR DTC144EK
Q20	8-729-901-06	s	TRANSISTOR DTA144EK
Q22	8-729-901-01	s	TRANSISTOR DTC144EK
Q23	8-729-901-01	s	TRANSISTOR DTC144EK
Q25	8-729-901-01	s	TRANSISTOR DTC144EK
Q28	8-729-901-01	s	TRANSISTOR DTC144EK
Q29	8-729-901-01	s	TRANSISTOR DTC144EK
Q30	8-729-901-01	s	TRANSISTOR DTC144EK
Q32	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q33	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q34	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q35	8-729-901-01	s	TRANSISTOR DTC144EK
Q38	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
R1	1-216-049-00	s	METAL 1K 5% 1/10W
R2	1-216-049-00	s	METAL 1K 5% 1/10W
R3	1-216-025-00	s	METAL 100 5% 1/10W
R4	1-216-049-00	s	METAL 1K 5% 1/10W
R5	1-216-097-00	s	METAL 100K 5% 1/10W
R6	1-216-097-00	s	METAL 100K 5% 1/10W
R7	1-216-097-00	s	METAL 100K 5% 1/10W
R8	1-216-097-00	s	METAL 100K 5% 1/10W
R9	1-216-097-00	s	METAL 100K 5% 1/10W
R10	1-216-097-00	s	METAL 100K 5% 1/10W
R11	1-216-097-00	s	METAL 100K 5% 1/10W
R12	1-216-097-00	s	METAL 100K 5% 1/10W
R13	1-216-097-00	s	METAL 100K 5% 1/10W
R14	1-216-065-00	s	METAL 4.7K 5% 1/10W
R15	1-216-065-00	s	METAL 4.7K 5% 1/10W
R16	1-216-065-00	s	METAL 4.7K 5% 1/10W
R17	1-216-065-00	s	METAL 4.7K 5% 1/10W
R18	1-216-065-00	s	METAL 4.7K 5% 1/10W
R19	1-216-065-00	s	METAL 4.7K 5% 1/10W
R20	1-216-065-00	s	METAL 4.7K 5% 1/10W
R21	1-216-065-00	s	METAL 4.7K 5% 1/10W
R22	1-216-065-00	s	METAL 4.7K 5% 1/10W
R23	1-216-073-00	s	METAL 10K 5% 1/10W
R24	1-216-073-00	s	METAL 10K 5% 1/10W
R25	1-216-073-00	s	METAL 10K 5% 1/10W
R26	1-216-073-00	s	METAL 10K 5% 1/10W
R27	1-216-073-00	s	METAL 10K 5% 1/10W
R28	1-216-073-00	s	METAL 10K 5% 1/10W
R29	1-216-073-00	s	METAL 10K 5% 1/10W
R30	1-216-073-00	s	METAL 10K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SY-18C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R31	1-216-073-00	s	METAL 10K 5% 1/10W
R32	1-216-073-00	s	METAL 10K 5% 1/10W
R33	1-216-073-00	s	METAL 10K 5% 1/10W
R34	1-216-073-00	s	METAL 10K 5% 1/10W
R35	1-216-065-00	s	METAL 4.7K 5% 1/10W
R36	1-216-065-00	s	METAL 4.7K 5% 1/10W
R37	1-216-073-00	s	METAL 10K 5% 1/10W
R38	1-216-073-00	s	METAL 10K 5% 1/10W
R39	1-216-073-00	s	METAL 10K 5% 1/10W
R40	1-216-073-00	s	METAL 10K 5% 1/10W
R41	1-216-049-00	s	METAL 1K 5% 1/10W
R42	1-216-049-00	s	METAL 1K 5% 1/10W
R43	1-216-049-00	s	METAL 1K 5% 1/10W
R44	1-216-049-00	s	METAL 1K 5% 1/10W
R45	1-216-025-00	s	METAL 100 5% 1/10W
R46	1-216-025-00	s	METAL 100 5% 1/10W
R47	1-216-025-00	s	METAL 100 5% 1/10W
R48	1-216-025-00	s	METAL 100 5% 1/10W
R49	1-216-025-00	s	METAL 100 5% 1/10W
R50	1-216-025-00	s	METAL 100 5% 1/10W
R51	1-216-049-00	s	METAL 1K 5% 1/10W
R52	1-216-049-00	s	METAL 1K 5% 1/10W
R53	1-216-065-00	s	METAL 4.7K 5% 1/10W
R54	1-215-408-00	s	METAL 300 1% 1/4W
R55	1-215-446-00	s	METAL 11K 1% 1/4W
R56	1-216-073-00	s	METAL 10K 5% 1/10W
R57	1-216-033-00	s	METAL 220 5% 1/10W
R58	1-216-067-00	s	METAL 5.6K 5% 1/10W
R59	1-216-067-00	s	METAL 5.6K 5% 1/10W
R60	1-216-033-00	s	METAL 220 5% 1/10W
R61	1-216-033-00	s	METAL 220 5% 1/10W
R62	1-216-097-00	s	METAL 100K 5% 1/10W
R63	1-216-097-00	s	METAL 100K 5% 1/10W
R64	1-216-081-00	s	METAL 22K 5% 1/10W
R65	1-216-065-00	s	METAL 4.7K 5% 1/10W
R66	1-216-089-91	s	METAL 47K 5% 1/10W
R67	1-216-065-00	s	METAL 4.7K 5% 1/10W
R68	1-216-097-00	s	METAL 100K 5% 1/10W
R69	1-216-037-00	s	METAL 330 5% 1/10W
R70	1-216-091-00	s	METAL 56K 5% 1/10W
R71	1-215-447-00	s	METAL 12K 1% 1/4W
R72	1-215-451-00	s	METAL 18K 1% 1/4W
R73	1-216-095-00	s	METAL 82K 5% 1/10W
R74	1-216-049-00	s	METAL 1K 5% 1/10W
R76	1-216-089-91	s	METAL 47K 5% 1/10W
R77	1-216-091-00	s	METAL 56K 5% 1/10W
R78	1-216-033-00	s	METAL 220 5% 1/10W
R79	1-216-073-00	s	METAL 10K 5% 1/10W
R80	1-216-121-00	s	METAL 1M 5% 1/10W
R81	1-216-097-00	s	METAL 100K 5% 1/10W
R82	1-216-097-00	s	METAL 100K 5% 1/10W
R83	1-216-081-00	s	METAL 22K 5% 1/10W
R84	1-216-073-00	s	METAL 10K 5% 1/10W
R85	1-216-097-00	s	METAL 100K 5% 1/10W
R86	1-216-089-91	s	METAL 47K 5% 1/10W

(SY-18C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R87	1-216-121-00	s	METAL 1M 5% 1/10W
R88	1-216-073-00	s	METAL 10K 5% 1/10W
R89	1-216-097-00	s	METAL 100K 5% 1/10W
R90	1-216-073-00	s	METAL 10K 5% 1/10W
R91	1-216-049-00	s	METAL 1K 5% 1/10W
R92	1-216-073-00	s	METAL 10K 5% 1/10W
R93	1-216-073-00	s	METAL 10K 5% 1/10W
R94	1-216-113-00	s	METAL 470K 5% 1/10W
R95	1-216-073-00	s	METAL 10K 5% 1/10W
R96	1-216-121-00	s	METAL 1M 5% 1/10W
R97	1-216-073-00	s	METAL 10K 5% 1/10W
R98	1-216-049-00	s	METAL 1K 5% 1/10W
R99	1-216-049-00	s	METAL 1K 5% 1/10W
R105	1-216-049-00	s	METAL 1K 5% 1/10W
R106	1-216-049-00	s	METAL 1K 5% 1/10W
R107	1-216-049-00	s	METAL 1K 5% 1/10W
R110	1-216-049-00	s	METAL 1K 5% 1/10W
R111	1-216-049-00	s	METAL 1K 5% 1/10W
R112	1-216-025-00	s	METAL 100 5% 1/10W
R113	1-216-025-00	s	METAL 100 5% 1/10W
R114	1-216-025-00	s	METAL 100 5% 1/10W
R115	1-216-025-00	s	METAL 100 5% 1/10W
R116	1-216-073-00	s	METAL 10K 5% 1/10W
R117	1-216-041-00	s	METAL 470 5% 1/10W
R118	1-216-049-00	s	METAL 1K 5% 1/10W
R119	1-216-097-00	s	METAL 100K 5% 1/10W
R121	1-216-049-00	s	METAL 1K 5% 1/10W
R122	1-216-097-00	s	METAL 100K 5% 1/10W
R123	1-216-029-00	s	METAL 150 5% 1/10W
R124	1-216-073-00	s	METAL 10K 5% 1/10W
R125	1-216-057-00	s	METAL 2.2K 5% 1/10W
R126	1-216-073-00	s	METAL 10K 5% 1/10W
R127	1-216-073-00	s	METAL 10K 5% 1/10W
R128	1-216-057-00	s	METAL 2.2K 5% 1/10W
R129	1-216-057-00	s	METAL 2.2K 5% 1/10W
R130	1-216-089-91	s	METAL 47K 5% 1/10W
R140	1-216-037-00	s	METAL 330 5% 1/10W
R141	1-216-049-00	s	METAL 1K 5% 1/10W
R142	1-216-049-00	s	METAL 1K 5% 1/10W
R143	1-216-049-00	s	METAL 1K 5% 1/10W
R144	1-216-049-00	s	METAL 1K 5% 1/10W
R145	1-216-091-00	s	METAL 56K 5% 1/10W
R146	1-216-091-00	s	METAL 56K 5% 1/10W
R147	1-216-067-00	s	METAL 5.6K 5% 1/10W
R148	1-216-067-00	s	METAL 5.6K 5% 1/10W
R149	1-216-065-00	s	METAL 4.7K 5% 1/10W
R150	1-216-067-00	s	METAL 5.6K 5% 1/10W
R151	1-216-067-00	s	METAL 5.6K 5% 1/10W
R152	1-216-067-00	s	METAL 5.6K 5% 1/10W
R153	1-216-089-91	s	METAL 47K 5% 1/10W
R154	1-216-089-91	s	METAL 47K 5% 1/10W
R155	1-216-073-00	s	METAL 10K 5% 1/10W
R156	1-216-097-00	s	METAL 100K 5% 1/10W
R157	1-216-097-00	s	METAL 100K 5% 1/10W
R158	1-216-097-00	s	METAL 100K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SY-18C BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R159	1-216-097-00	s	METAL 100K 5% 1/10W
R160	1-216-057-00	s	METAL 2.2K 5% 1/10W
R161	1-216-073-00	s	METAL 10K 5% 1/10W
R162	1-216-091-00	s	METAL 56K 5% 1/10W
R163	1-216-085-00	s	METAL 33K 5% 1/10W
R164	1-216-097-00	s	METAL 100K 5% 1/10W
R165	1-216-081-00	s	METAL 22K 5% 1/10W
R166	1-216-057-00	s	METAL 2.2K 5% 1/10W
R167	1-216-065-00	s	METAL 4.7K 5% 1/10W
R168	1-216-049-00	s	METAL 1K 5% 1/10W
R169	1-216-091-00	s	METAL 56K 5% 1/10W
R170	1-216-057-00	s	METAL 2.2K 5% 1/10W
R171	1-216-073-00	s	METAL 10K 5% 1/10W
R172	1-216-085-00	s	METAL 33K 5% 1/10W
R173	1-216-097-00	s	METAL 100K 5% 1/10W
R174	1-216-081-00	s	METAL 22K 5% 1/10W
R175	1-216-025-00	s	METAL 100 5% 1/10W
R176	1-216-065-00	s	METAL 4.7K 5% 1/10W
R177	1-216-035-00	s	METAL 270 5% 1/10W
R178	1-216-035-00	s	METAL 270 5% 1/10W
R179	1-216-049-00	s	METAL 1K 5% 1/10W
R180	1-216-049-00	s	METAL 1K 5% 1/10W
R181	1-216-049-00	s	METAL 1K 5% 1/10W
R182	1-216-049-00	s	METAL 1K 5% 1/10W
R183	1-216-049-00	s	METAL 1K 5% 1/10W
R184	1-216-049-00	s	METAL 1K 5% 1/10W
R185	1-216-049-00	s	METAL 1K 5% 1/10W
R186	1-216-049-00	s	METAL 1K 5% 1/10W
R187	1-216-049-00	s	METAL 1K 5% 1/10W
R188	1-216-049-00	s	METAL 1K 5% 1/10W
R189	1-216-025-00	s	METAL 100 5% 1/10W
R190	1-216-025-00	s	METAL 100 5% 1/10W
R191	1-216-025-00	s	METAL 100 5% 1/10W
R192	1-216-121-00	s	METAL 1M 5% 1/10W
R193	1-216-109-00	s	METAL 330K 5% 1/10W
R194	1-216-049-00	s	METAL 1K 5% 1/10W
R195	1-216-073-00	s	METAL 10K 5% 1/10W
R196	1-216-073-00	s	METAL 10K 5% 1/10W
R197	1-216-097-00	s	METAL 100K 5% 1/10W
R198	1-216-037-00	s	METAL 330 5% 1/10W
R199	1-216-081-00	s	METAL 22K 5% 1/10W
R200	1-216-089-91	s	METAL 47K 5% 1/10W
R201	1-216-089-91	s	METAL 47K 5% 1/10W
R202	1-216-089-91	s	METAL 47K 5% 1/10W
R203	1-216-025-00	s	METAL 100 5% 1/10W
R204	1-216-081-00	s	METAL 22K 5% 1/10W
R205	1-247-807-31	s	CARBON 100 5% 1/4W
R207	1-216-105-00	s	METAL 220K 5% 1/10W
R208	1-216-081-00	s	METAL 22K 5% 1/10W
R209	1-216-049-00	s	METAL 1K 5% 1/10W
R210	1-216-049-00	s	METAL 1K 5% 1/10W
R211	1-216-049-00	s	METAL 1K 5% 1/10W
R212	1-216-049-00	s	METAL 1K 5% 1/10W
R213	1-216-025-00	s	METAL 100 5% 1/10W
R214	1-216-049-00	s	METAL 1K 5% 1/10W

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Ref. No. or Q'ty	Part No.	SP	Description
R215	1-216-073-00	s	METAL 10K 5% 1/10W
R216	1-216-073-00	s	METAL 10K 5% 1/10W
R217	1-216-073-00	s	METAL 10K 5% 1/10W
R218	1-216-073-00	s	METAL 10K 5% 1/10W
R223	1-216-049-00	s	METAL 1K 5% 1/10W
R225	1-216-025-00	s	METAL 100 5% 1/10W
R226	1-216-097-00	s	METAL 100K 5% 1/10W
R227	1-216-073-00	s	METAL 10K 5% 1/10W
R230	1-216-025-00	s	METAL 100 5% 1/10W
R231	1-216-025-00	s	METAL 100 5% 1/10W
R232	1-216-065-00	s	METAL 4.7K 5% 1/10W
R238	1-216-107-00	s	METAL 270K 5% 1/10W
R239	1-216-091-00	s	METAL 56K 5% 1/10W
R240	1-216-089-91	s	METAL 47K 5% 1/10W
R241	1-216-105-00	s	METAL 220K 5% 1/10W
R250	1-216-097-00	s	METAL 100K 5% 1/10W
R252	1-216-033-00	s	METAL 220 5% 1/10W
R253	1-216-049-00	s	METAL 1K 5% 1/10W
R254	1-216-049-00	s	METAL 1K 5% 1/10W
R255	1-216-049-00	s	METAL 1K 5% 1/10W
R257	1-216-073-00	s	METAL 10K 5% 1/10W
R258	1-216-097-00	s	METAL 100K 5% 1/10W
R259	1-216-049-00	s	METAL 1K 5% 1/10W
RV1	1-228-395-00	s	RES, ADJ, METAL GLAZE 10K
RV2	1-228-813-00	s	RES, ADJ, METAL GLAZE 470K
RV3	1-228-813-00	s	RES, ADJ, METAL GLAZE 470K
TP1	3-657-235-00	o	POINT, TEST
TP3	3-657-235-00	o	POINT, TEST
TP4	3-657-235-00	o	POINT, TEST
TP5	3-657-235-00	o	POINT, TEST
TP6	3-657-235-00	o	POINT, TEST
TP9	3-657-235-00	o	POINT, TEST
#X1	1-567-859-11	s	VIBRATOR, CRYSTAL 3.579545MHz
#X2	1-567-192-11	s	OSCILLATOR, CERAMIC 4.0MHz

SY-22A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6717-406-A	o	MOUNTED CIRCUIT BOARD, SY-22A
1pc	1-562-150-11	o	HOUSING, CONNECTOR 5P
2pcs	1-562-157-11	o	HOUSING, CONNECTOR 12P
3pcs	1-562-605-11	o	CONTACT, CONNECTOR
1pc	1-562-609-11	o	HOUSING, CONNECTOR
2pcs	1-562-616-11	o	HOUSING, CONNECTOR
1pc	3-659-487-00	s	HOLDER, BUZER
1pc	3-659-488-00	s	PIN, BUZER HOLDER
1pc	3-696-906-01	o	SHEET (B), INSULATING, SY PCB
1pc	7-621-770-67	s	SCREW +B 2.6×6
1pc	1-613-101-11	o	PRINTED CIRCUIT BOARD, SY-23

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SY-22A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C2	1-126-154-11	s	ELECT 47uF 20% 6.3V
C4	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C5	1-163-235-11	s	CERAMIC 22PF 5% 50V
C6	1-124-248-00	s	ELECT 22uF 20% 25V
C7	1-163-035-00	s	CERAMIC 0.047uF 50V
C8	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C9	1-102-114-00	s	CERAMIC 470PF 10% 50V
C10	1-163-035-00	s	CERAMIC 0.047uF 50V
C11	1-102-114-00	s	CERAMIC 470PF 10% 50V
C12	1-124-463-00	s	ELECT 0.1uF 20% 50V
C13	1-126-157-11	s	ELECT 10uF 20% 16V
C14	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C15	1-163-035-00	s	CERAMIC 0.047uF 50V
C16	1-163-035-00	s	CERAMIC 0.047uF 50V
C17	1-124-589-11	s	ELECT 47uF 20% 16V
C18	1-163-035-00	s	CERAMIC 0.047uF 50V
C19	1-126-154-11	s	ELECT 47uF 20% 6.3V
C20	1-124-589-11	s	ELECT 47uF 20% 16V
C21	1-131-343-00	s	TANTALUM 0.22uF 10% 35V
C22	1-131-347-00	s	TANTALUM 1uF 10% 35V
C23	1-131-347-00	s	TANTALUM 1uF 10% 35V
C24	1-131-347-00	s	TANTALUM 1uF 10% 35V
C25	1-131-347-00	s	TANTALUM 1uF 10% 35V
C26	1-131-347-00	s	TANTALUM 1uF 10% 35V
C27	1-131-347-00	s	TANTALUM 1uF 10% 35V
C28	1-131-347-00	s	TANTALUM 1uF 10% 35V
C29	1-131-347-00	s	TANTALUM 1uF 10% 35V
C30	1-131-347-00	s	TANTALUM 1uF 10% 35V
C31	1-131-347-00	s	TANTALUM 1uF 10% 35V
C32	1-131-347-00	s	TANTALUM 1uF 10% 35V
C33	1-131-347-00	s	TANTALUM 1uF 10% 35V
C34	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C35	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C36	1-126-301-11	s	ELECT 1uF 20% 50V
C37	1-163-009-11	s	CERAMIC 0.001uF 10% 50V
C38	1-126-768-11	s	ELECT 2200uF 20% 16V
C39	1-126-768-11	s	ELECT 2200uF 20% 16V
C40	1-126-768-11	s	ELECT 2200uF 20% 16V
C41	1-163-035-00	s	CERAMIC 0.047uF 50V
C50	1-163-005-11	s	CERAMIC 470PF 10% 50V
C51	1-163-038-00	s	CERAMIC 0.1uF 25V
C52	1-163-035-00	s	CERAMIC 0.047uF 50V
C53	1-163-035-00	s	CERAMIC 0.047uF 50V
C54	1-163-035-00	s	CERAMIC 0.047uF 50V
C55	1-124-248-00	s	ELECT 22uF 20% 25V
CN201	1-564-007-11	o	PIN, CONNECTOR 8P
CN202	1-506-473-11	s	PIN, CONNECTOR 8P
CN203	1-506-469-11	s	PIN, CONNECTOR 4P
CN204	1-506-469-11	s	PIN, CONNECTOR 4P
CN207	1-564-013-31	s	PIN, CONNECTOR 3P
CN208	1-564-013-41	s	PIN, CONNECTOR 3P
CN209	1-506-468-11	s	PIN, CONNECTOR 3P
CN210	1-506-468-11	s	PIN, CONNECTOR 3P
CN211	1-564-013-11	o	PIN, CONNECTOR 3P
CN212	1-506-468-11	s	PIN, CONNECTOR 3P
CN213	1-564-013-21	s	PIN, CONNECTOR 3P
CN214	1-564-013-31	s	PIN, CONNECTOR 3P
CN215	1-564-002-41	s	PIN, CONNECTOR 3P
CN216	1-506-468-11	s	PIN, CONNECTOR 3P
CN217	1-506-468-11	s	PIN, CONNECTOR 3P
CN218	1-506-468-11	s	PIN, CONNECTOR 3P
CN219	1-564-002-41	s	PIN, CONNECTOR 3P
CN220	1-506-471-11	s	PIN, CONNECTOR 6P
CN256	1-506-474-11	s	PIN, CONNECTOR 9P
CN265	1-557-607-11	o	WIRE, JUMPER (HIGH WINDING)
CN288	1-564-013-21	s	PIN, CONNECTOR 3P
D1	8-719-800-76	s	DIODE 1SS226
D2	8-719-104-34	s	DIODE 1S2836
D3	8-719-104-34	s	DIODE 1S2836
D4	8-719-104-34	s	DIODE 1S2836
D5	8-719-104-34	s	DIODE 1S2836
D6	8-719-104-34	s	DIODE 1S2836
D7	8-719-104-34	s	DIODE 1S2836
D8	8-719-911-19	s	DIODE 1SS119
D9	8-719-911-19	s	DIODE 1SS119
D10	8-719-400-18	s	DIODE MA152WK
D11	8-719-400-18	s	DIODE MA152WK
IC1	8-759-201-60	s	IC TC40H002F (TOSHIBA)
IC2	8-759-911-72	s	IC MB88501-247M (FUJITSU)
IC3	8-759-201-47	s	IC TA7357AP (TOSHIBA)
IC4	8-759-400-89	s	IC MN1237AD (MATSUSHITA)
IC5	8-759-102-82	s	IC UPD82C43G (NEC)
IC6	8-759-200-67	s	IC TC4001BF (TOSHIBA)
IC7	8-759-600-24	s	IC M54543L (MITSUBISHI)
IC8	8-759-200-90	s	IC TC4538BF (TOSHIBA)
IC9	8-759-102-82	s	IC UPD82C43G (NEC)
IC10	8-759-200-79	s	IC TC4049BF (TOSHIBA)
IC11	8-741-135-40	s	IC BX1354 (SONY)
Q2	8-729-901-01	s	TRANSISTOR DTC144EK
Q3	8-729-901-01	s	TRANSISTOR DTC144EK
Q8	8-729-901-01	s	TRANSISTOR DTC144EK
Q9	8-729-901-01	s	TRANSISTOR DTC144EK
Q10	8-729-901-01	s	TRANSISTOR DTC144EK
Q11	8-729-901-46	s	TRANSISTOR DTA114YK
Q12	8-729-901-06	s	TRANSISTOR DTA144EK
Q13	8-729-901-01	s	TRANSISTOR DTC144EK
Q14	8-729-901-01	s	TRANSISTOR DTC144EK
Q15	8-729-901-46	s	TRANSISTOR DTA114YK
Q16	8-729-100-04	s	TRANSISTOR 2SD992-K
Q16	8-729-901-01	s	TRANSISTOR DTC144EK
Q17	8-729-901-06	s	TRANSISTOR DTA144EK
Q19	8-729-901-01	s	TRANSISTOR DTC144EK
Q20	8-729-901-01	s	TRANSISTOR DTC144EK
Q22	8-729-901-01	s	TRANSISTOR DTC144EK
Q26	8-729-901-01	s	TRANSISTOR DTC144EK
R1	1-216-097-00	s	METAL 100K 5% 1/10W
R2	1-216-065-00	s	METAL 4.7K 5% 1/10W
R3	1-216-097-00	s	METAL 100K 5% 1/10W
R4	1-216-065-00	s	METAL 4.7K 5% 1/10W
R5	1-216-097-00	s	METAL 100K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SY-22A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R6	1-216-065-00	s	METAL 4.7K 5% 1/10W
R7	1-216-097-00	s	METAL 100K 5% 1/10W
R8	1-216-065-00	s	METAL 4.7K 5% 1/10W
R10	1-216-025-00	s	METAL 100 5% 1/10W
R11	1-216-025-00	s	METAL 100 5% 1/10W
R12	1-216-025-00	s	METAL 100 5% 1/10W
R13	1-216-025-00	s	METAL 100 5% 1/10W
R14	1-216-089-91	s	METAL 47K 5% 1/10W
R15	1-216-025-00	s	METAL 100 5% 1/10W
R16	1-216-025-00	s	METAL 100 5% 1/10W
R17	1-216-049-00	s	METAL 1K 5% 1/10W
R19	1-216-121-00	s	METAL 1M 5% 1/10W
R20	1-216-121-00	s	METAL 1M 5% 1/10W
R21	1-216-121-00	s	METAL 1M 5% 1/10W
R22	1-216-037-00	s	METAL 330 5% 1/10W
R23	1-215-478-00	s	METAL 240K 1% 1/4W
R24	1-215-471-00	s	METAL 120K 1% 1/4W
R25	1-215-464-00	s	METAL 62K 1% 1/4W
R26	1-216-089-91	s	METAL 47K 5% 1/10W
R27	1-216-061-00	s	METAL 3.3K 5% 1/10W
R28	1-216-095-00	s	METAL 82K 5% 1/10W
R29	1-216-075-00	s	METAL 12K 5% 1/10W
R30	1-216-113-00	s	METAL 470K 5% 1/10W
R31	1-216-101-00	s	METAL 150K 5% 1/10W
R32	1-216-049-00	s	METAL 1K 5% 1/10W
R33	1-216-049-00	s	METAL 1K 5% 1/10W
R34	1-216-049-00	s	METAL 1K 5% 1/10W
R35	1-216-049-00	s	METAL 1K 5% 1/10W
R36	1-216-061-00	s	METAL 3.3K 5% 1/10W
R37	1-216-089-91	s	METAL 47K 5% 1/10W
R38	1-216-025-00	s	METAL 100 5% 1/10W
R39	1-216-025-00	s	METAL 100 5% 1/10W
R40	1-216-025-00	s	METAL 100 5% 1/10W
R41	1-216-025-00	s	METAL 100 5% 1/10W
R42	1-216-073-00	s	METAL 10K 5% 1/10W
R43	1-216-097-00	s	METAL 100K 5% 1/10W
R44	1-216-049-00	s	METAL 1K 5% 1/10W
R45	1-216-049-00	s	METAL 1K 5% 1/10W
R46	1-216-025-00	s	METAL 100 5% 1/10W
R47	1-216-025-00	s	METAL 100 5% 1/10W
R48	1-216-025-00	s	METAL 100 5% 1/10W
R49	1-216-025-00	s	METAL 100 5% 1/10W
R50	1-216-089-91	s	METAL 47K 5% 1/10W
R51	1-216-049-00	s	METAL 1K 5% 1/10W
R52	1-216-073-00	s	METAL 10K 5% 1/10W
R53	1-216-049-00	s	METAL 1K 5% 1/10W
R54	1-216-073-00	s	METAL 10K 5% 1/10W
R55	1-216-067-00	s	METAL 5.6K 5% 1/10W
R56	1-216-057-00	s	METAL 2.2K 5% 1/10W
R57	1-216-057-00	s	METAL 2.2K 5% 1/10W
R58	1-216-025-00	s	METAL 100 5% 1/10W
R59	1-216-025-00	s	METAL 100 5% 1/10W
#R61	1-216-079-00	s	METAL 18K 5% 1/10W
R62	1-216-065-00	s	METAL 4.7K 5% 1/10W
R64	1-216-065-00	s	METAL 4.7K 5% 1/10W

(SY-22A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R65	1-216-065-00	s	METAL 4.7K 5% 1/10W
R66	1-216-067-00	s	METAL 5.6K 5% 1/10W
R67	1-216-049-00	s	METAL 1K 5% 1/10W
#R68	1-216-069-00	s	METAL 6.8K 5% 1/10W
R69	1-216-057-00	s	METAL 2.2K 5% 1/10W
R70	1-216-073-00	s	METAL 10K 5% 1/10W
R71	1-216-073-00	s	METAL 10K 5% 1/10W
R72	1-216-073-00	s	METAL 10K 5% 1/10W
R73	1-216-073-00	s	METAL 10K 5% 1/10W
R74	1-216-073-00	s	METAL 10K 5% 1/10W
R75	1-216-073-00	s	METAL 10K 5% 1/10W
R76	1-216-089-91	s	METAL 47K 5% 1/10W
R77	1-216-073-00	s	METAL 10K 5% 1/10W
R78	1-216-065-00	s	METAL 4.7K 5% 1/10W
R79	1-216-089-91	s	METAL 47K 5% 1/10W
R80	1-216-049-00	s	METAL 1K 5% 1/10W
R81	1-216-095-00	s	METAL 82K 5% 1/10W
R82	1-216-049-00	s	METAL 1K 5% 1/10W
R83	1-216-065-00	s	METAL 4.7K 5% 1/10W
R84	1-216-089-91	s	METAL 47K 5% 1/10W
R85	1-216-049-00	s	METAL 1K 5% 1/10W
R86	1-216-095-00	s	METAL 82K 5% 1/10W
R87	1-216-049-00	s	METAL 1K 5% 1/10W
R88	1-216-065-00	s	METAL 4.7K 5% 1/10W
R89	1-216-089-91	s	METAL 47K 5% 1/10W
R90	1-216-049-00	s	METAL 1K 5% 1/10W
R91	1-216-095-00	s	METAL 82K 5% 1/10W
R92	1-216-049-00	s	METAL 1K 5% 1/10W
R93	1-216-065-00	s	METAL 4.7K 5% 1/10W
R94	1-216-089-91	s	METAL 47K 5% 1/10W
R95	1-216-049-00	s	METAL 1K 5% 1/10W
R96	1-216-095-00	s	METAL 82K 5% 1/10W
R97	1-216-049-00	s	METAL 1K 5% 1/10W
R98	1-216-065-00	s	METAL 4.7K 5% 1/10W
R99	1-216-089-91	s	METAL 47K 5% 1/10W
R100	1-216-049-00	s	METAL 1K 5% 1/10W
R101	1-216-095-00	s	METAL 82K 5% 1/10W
R102	1-216-049-00	s	METAL 1K 5% 1/10W
R103	1-216-065-00	s	METAL 4.7K 5% 1/10W
R104	1-216-089-91	s	METAL 47K 5% 1/10W
R105	1-216-049-00	s	METAL 1K 5% 1/10W
R106	1-216-095-00	s	METAL 82K 5% 1/10W
R107	1-216-049-00	s	METAL 1K 5% 1/10W
R108	1-216-049-00	s	METAL 1K 5% 1/10W
R109	1-216-049-00	s	METAL 1K 5% 1/10W
R110	1-216-049-00	s	METAL 1K 5% 1/10W
R111	1-216-049-00	s	METAL 1K 5% 1/10W
R112	1-216-049-00	s	METAL 1K 5% 1/10W
R113	1-216-049-00	s	METAL 1K 5% 1/10W
R114	1-216-049-00	s	METAL 1K 5% 1/10W
R115	1-216-049-00	s	METAL 1K 5% 1/10W
R116	1-216-097-00	s	METAL 100K 5% 1/10W
R117	1-216-049-00	s	METAL 1K 5% 1/10W
R120	1-532-686-21	s	LINK

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SY-22A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R121	1-532-686-21	s	LINK
R122	1-532-686-21	s	LINK
R125	1-249-417-11	s	CARBON 1K 5% 1/4W
R126	1-216-065-00	s	METAL 4.7K 5% 1/10W
R127	1-216-065-00	s	METAL 4.7K 5% 1/10W
R128	1-216-065-00	s	METAL 4.7K 5% 1/10W
R129	1-249-425-11	s	CARBON 4.7K 5% 1/4W
R140	1-216-109-00	s	METAL 330K 5% 1/10W
RV1	1-228-394-00	s	RES, ADJ, METAL GLAZE 4.7K
RV2	1-228-760-00	s	RES, ADJ, METAL GLAZE 47K
SW1	1-553-977-00	s	SWITCH, SLIDE

SY-23 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
			All of the component parts on the SY-23 board are supplied together when you order SY-22A board.
C1	1-163-035-00	s	CERAMIC, CHIP 0.047uF 50V
C2	1-124-589-11	s	ELECT 47uF 20% 16V
C3	1-126-162-11	s	ELECT 3.3uF 20% 50V
CN291	1-564-013-21	s	PIN, CONNECTOR 3P
D1	8-719-980-78	s	DIODE ERA83-006
D2	8-719-400-18	s	DIODE MA152WK
D3	8-719-200-02	s	DIODE 10E-2
D4	8-719-160-63	s	DIODE RD15F-B3
D5	8-719-980-78	s	DIODE ERA83-006
D6	8-719-400-18	s	DIODE MA152WK
D7	8-719-200-02	s	DIODE 10E-2
D8	8-719-160-63	s	DIODE RD15F-B3
D9	8-719-200-02	s	DIODE 10E-2
D10	8-719-160-63	s	DIODE RD15F-B3
D11	8-719-980-78	s	DIODE ERA83-006
D12	8-719-400-18	s	DIODE MA152WK
D13	8-719-200-02	s	DIODE 10E-2
D14	8-719-160-63	s	DIODE RD15F-B3
D15	8-719-200-02	s	DIODE 10E-2
D16	8-719-160-63	s	DIODE RD15F-B3
D17	8-719-200-02	s	DIODE 10E-2
D18	8-719-160-63	s	DIODE RD15F-B3
D20	8-719-400-18	s	DIODE MA152WK
D21	8-719-400-18	s	DIODE MA152WK
#D22	8-719-911-19	s	DIODE 1SS119
IC1	8-759-009-04	s	IC MC4050BF(MOTOROLA)
IC2	8-759-009-04	s	IC MC4050BF(MOTOROLA)
Q2	8-729-901-01	s	TRANSISTOR DTC144EK
Q3	8-729-901-46	s	TRANSISTOR DTA114YK
Q4	8-729-100-04	s	TRANSISTOR 2SD992-K
Q5	8-729-901-01	s	TRANSISTOR DTC144EK
Q6	8-729-901-01	s	TRANSISTOR DTC144EK

(SY-23 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q7	8-729-901-46	s	TRANSISTOR DTA114YK
Q8	8-729-100-04	s	TRANSISTOR 2SD992-K
Q10	8-729-901-01	s	TRANSISTOR DTC144EK
Q11	8-729-901-46	s	TRANSISTOR DTA114YK
Q12	8-729-100-04	s	TRANSISTOR 2SD992-K
Q13	8-729-901-01	s	TRANSISTOR DTC144EK
Q14	8-729-901-01	s	TRANSISTOR DTC144EK
Q15	8-729-901-46	s	TRANSISTOR DTA114YK
Q16	8-729-100-04	s	TRANSISTOR 2SD992-K
Q17	8-729-901-01	s	TRANSISTOR DTC144EK
Q18	8-729-901-46	s	TRANSISTOR DTA114YK
Q19	8-729-100-04	s	TRANSISTOR 2SD992-K
Q20	8-729-901-01	s	TRANSISTOR DTC144EK
Q21	8-729-901-46	s	TRANSISTOR DTA114YK
Q22	8-729-100-04	s	TRANSISTOR 2SD992-K
Q24	8-729-901-01	s	TRANSISTOR DTC144EK
Q25	8-729-901-46	s	TRANSISTOR DTA114YK
Q26	8-729-100-04	s	TRANSISTOR 2SD992-K
Q27	8-729-901-01	s	TRANSISTOR DTC144EK
Q28	8-729-901-01	s	TRANSISTOR DTC144EK
Q29	8-729-901-46	s	TRANSISTOR DTA114YK
Q30	8-729-100-04	s	TRANSISTOR 2SD992-K
Q31	8-729-901-01	s	TRANSISTOR DTC144EK
Q32	8-729-901-46	s	TRANSISTOR DTA114YK
Q33	8-729-100-04	s	TRANSISTOR 2SD992-K
Q34	8-729-901-01	s	TRANSISTOR DTC144EK
Q35	8-729-901-46	s	TRANSISTOR DTA114YK
Q36	8-729-100-04	s	TRANSISTOR 2SD992-K
Q37	8-729-901-01	s	TRANSISTOR DTC144EK
Q38	8-729-901-46	s	TRANSISTOR DTA114YK
Q39	8-729-100-04	s	TRANSISTOR 2SD992-K
Q40	8-729-901-01	s	TRANSISTOR DTC144EK
Q41	8-729-901-46	s	TRANSISTOR DTA114YK
Q42	8-729-100-04	s	TRANSISTOR 2SD992-K
Q43	8-729-901-46	s	TRANSISTOR DTA114YK
R1	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R2	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R4	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R5	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R6	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R7	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R8	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R10	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R11	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R12	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R13	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R14	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R15	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R16	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R17	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R18	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R20	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R21	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R22	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R23	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(SY-23 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R24	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R25	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R26	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R27	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R28	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R29	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R30	1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R31	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R32	1-216-041-00	s	METAL, CHIP 470 5% 1/10W
R34	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W

TM-19 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-548-119-21	s	HOURS METER
1pc	1-562-148-11	o	HOUSING, CONNECTOR 3P
1pc	1-613-881-11	o	PRINTED CIRCUIT BOARD, TM-19

VA-29 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6711-647-A	o	MOUNTED CIRCUIT BOARD, VA-29
C1	1-124-584-00	s	ELECT 100uF 20% 10V
C2	1-124-589-11	s	ELECT 47uF 20% 16V
C3	1-124-589-11	s	ELECT 47uF 20% 16V
C4	1-126-096-11	s	ELECT 10uF 20% 25V
C5	1-124-589-11	s	ELECT 47uF 20% 16V
C6	1-124-589-11	s	ELECT 47uF 20% 16V
C7	1-126-154-11	s	ELECT 47uF 20% 6.3V
C8	1-126-157-11	s	ELECT 10uF 20% 16V
C9	1-126-154-11	s	ELECT 47uF 20% 6.3V
C10	1-124-584-00	s	ELECT 100uF 20% 10V
C11	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C12	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C13	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C15	1-126-154-11	s	ELECT 47uF 20% 6.3V
C16	1-126-157-11	s	ELECT 10uF 20% 10V
C17	1-162-716-11	s	CERAMIC 180PF 5% 50V
C18	1-126-157-11	s	ELECT 10uF 20% 10V
C19	1-124-589-11	s	ELECT 47uF 20% 16V
C20	1-124-589-11	s	ELECT 47uF 20% 16V
C21	1-126-154-11	s	ELECT 47uF 20% 6.3V
C23	1-131-402-00	s	TANTALUM 0.1uF 20% 35V
C24	1-124-584-00	s	ELECT 100uF 20% 10V
C25	1-124-234-00	s	ELECT 22uF 20% 16V
C26	1-124-234-00	s	ELECT 22uF 20% 16V
C27	1-107-211-00	s	MICA 24PF 5% 500V
C28	1-124-584-00	s	ELECT 100uF 20% 10V
C29	1-107-202-00	s	MICA 10PF 5% 500V

(VA-29 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
CN1	1-562-639-11	o	SOCKET, CONNECTOR 10P
CN2	1-562-639-11	o	SOCKET, CONNECTOR 10P
D1	8-719-101-98	s	DIODE 1SS97-0
D2	8-719-101-98	s	DIODE 1SS97-0
D3	8-719-104-10	s	DIODE 1SS99
D4	8-719-104-10	s	DIODE 1SS99
D5	8-719-104-10	s	DIODE 1SS99
D6	8-719-104-10	s	DIODE 1SS99
IC1	8-759-200-60	s	IC TA7060AP (TOSHIBA)
IC2	8-759-200-60	s	IC TA7060AP (TOSHIBA)
L1	1-407-169-XX	s	INDUCTOR 100uH
L2	1-407-169-XX	s	INDUCTOR 100uH
L3	1-408-948-00	s	INDUCTOR 220uH
L4	1-407-169-XX	s	INDUCTOR 100uH
L5	1-408-974-21	s	INDUCTOR 22uH
L6	1-407-504-00	s	INDUCTOR 10mH
L7	1-407-504-00	s	INDUCTOR 10mH
L8	1-408-977-21	s	INDUCTOR 39uH
Q1	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q2	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q3	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q4	8-729-216-22	s	TRANSISTOR 2SA1162G
Q5	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q6	8-729-216-22	s	TRANSISTOR 2SA1162G
Q7	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q8	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q9	8-729-230-49	s	TRANSISTOR 2SC2712
Q10	8-729-230-49	s	TRANSISTOR 2SC2712
Q11	8-729-230-49	s	TRANSISTOR 2SC2712
Q12	8-729-230-49	s	TRANSISTOR 2SC2712
Q13	8-729-230-49	s	TRANSISTOR 2SC2712
Q14	8-729-230-49	s	TRANSISTOR 2SC2712
Q15	8-729-230-49	s	TRANSISTOR 2SC2712
Q16	8-729-107-45	s	TRANSISTOR 2SD1030
Q17	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q18	8-729-230-49	s	TRANSISTOR 2SC2712-YG
R1	1-216-073-00	s	METAL 10K 5% 1/10W
R2	1-216-065-00	s	METAL 4.7K 5% 1/10W
R3	1-215-413-00	s	METAL 470 1% 1/4W
R4	1-216-061-00	s	METAL 3.3K 5% 1/10W
R5	1-216-051-00	s	METAL 1.2K 5% 1/10W
R6	1-216-077-00	s	METAL 15K 5% 1/10W
R7	1-216-049-00	s	METAL 1K 5% 1/10W
R8	1-216-089-91	s	METAL 47K 5% 1/10W
R9	1-216-089-91	s	METAL 47K 5% 1/10W
R10	1-249-398-11	s	CARBON 27 5% 1/4W
R11	1-216-049-00	s	METAL 1K 5% 1/10W
R12	1-216-061-00	s	METAL 3.3K 5% 1/10W
R13	1-216-073-00	s	METAL 10K 5% 1/10W
R14	1-216-067-00	s	METAL 5.6K 5% 1/10W
R15	1-216-073-00	s	METAL 10K 5% 1/10W
R16	1-216-059-00	s	METAL 2.7K 5% 1/10W
R17	1-215-405-00	s	METAL 220 1% 1/4W
R18	1-215-405-00	s	METAL 220 1% 1/4W
R19	1-215-450-00	s	METAL 16K 1% 1/4W
R20	1-216-067-00	s	METAL 5.6K 5% 1/10W

Note: For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VA-29 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R21	1-216-049-00	s	METAL 1K 5% 1/10W
R22	1-215-402-00	s	METAL 160 1% 1/4W
R23	1-215-408-00	s	METAL 300 1% 1/4W
R24	1-249-404-00	s	CARBON 82 5% 1/4W
R25	1-216-033-00	s	METAL 220 5% 1/10W
R26	1-215-394-00	s	METAL 75 1% 1/4W
R27	1-216-085-00	s	METAL 33K 5% 1/10W
R28	1-216-073-00	s	METAL 10K 5% 1/10W
R29	1-216-049-00	s	METAL 1K 5% 1/10W
R30	1-216-031-00	s	METAL 180 5% 1/10W
R31	1-216-033-00	s	METAL 220 5% 1/10W
R32	1-216-049-00	s	METAL 1K 5% 1/10W
R33	1-216-073-00	s	METAL 10K 5% 1/10W
R34	1-216-057-00	s	METAL 2.2K 5% 1/10W
R35	1-216-073-00	s	METAL 10K 5% 1/10W
R36	1-216-061-00	s	METAL 3.3K 5% 1/10W
R37	1-216-041-00	s	METAL 470 5% 1/10W
R38	1-216-051-00	s	METAL 1.2K 5% 1/10W
R39	1-216-061-00	s	METAL 3.3K 5% 1/10W
R40	1-216-077-00	s	METAL 15K 5% 1/10W
R41	1-216-067-00	s	METAL 5.6K 5% 1/10W
R42	1-216-049-00	s	METAL 1K 5% 1/10W
R43	1-215-415-00	s	METAL 560 1% 1/4W
R44	1-215-405-00	s	METAL 220 1% 1/4W
R45	1-215-412-00	s	METAL 430 1% 1/4W
R46	1-216-049-00	s	METAL 1K 5% 1/10W
R47	1-216-061-00	s	METAL 3.3K 5% 1/10W
R48	1-216-025-00	s	METAL 100 5% 1/10W
R49	1-216-033-00	s	METAL 220 5% 1/10W
R51	1-216-061-00	s	METAL 3.3K 5% 1/10W
R52	1-216-081-00	s	METAL 22K 5% 1/10W
R56	1-216-081-00	s	METAL 22K 5% 1/10W
#R57	1-216-073-00	s	METAL 10K 5% 1/10W
#RV1	1-228-474-00	s	RES, ADJ, CERMET 10K
#RV2	1-228-471-00	s	RES, ADJ, CERMET 1K
#RV3	1-228-471-00	s	RES, ADJ, CERMET 1K
#RV4	1-228-471-00	s	RES, ADJ, CERMET 1K
TP2	3-657-703-01	o	TERMINAL, TP

VO-12 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6711-646-A	o	MOUNTED CIRCUIT BOARD, VO-12
1pc	3-654-058-21	o	SPACER (3X2.5)
1pc	7-621-770-67	s	SCREW +B 2.6×6
3pcs	3-694-708-01	o	SPACER, PC BOARD
3pcs	7-621-759-45	s	+PSW, 2.6×6
1pc	7-623-421-07	s	LW 2.6, TYPE B
6pcs	3-621-124-00	o	SPACER
1pc	1-616-334-11	o	PRINTED CIRCUIT BOARD, IF-99

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-124-589-11	s	ELECT 47uF 20% 16V
C2	1-124-584-00	s	ELECT 100uF 20% 10V
C3	1-163-141-00	s	CERAMIC 0.001uF 5% 50V
C4	1-163-037-11	s	CERAMIC 0.022uF 10% 25V
C5	1-126-157-11	s	ELECT 10uF 20% 10V
C6	1-124-589-11	s	ELECT 47uF 20% 16V
C7	1-124-589-11	s	ELECT 47uF 20% 16V
C8	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C9	1-163-035-00	s	CERAMIC 0.047uF 50V
C10	1-130-483-00	s	MYLAR 0.01uF 5% 50V
C11	1-107-208-00	s	MICA 18PF 5% 500V
C12	1-107-037-00	s	MICA 82PF 5% 500V
C13	1-126-157-11	s	ELECT 10uF 20% 16V
C14	1-126-157-11	s	ELECT 10uF 20% 16V
C15	1-124-584-00	s	ELECT 100uF 20% 10V
C51	1-124-589-11	s	ELECT 47uF 20% 16V
C53	1-124-589-11	s	ELECT 47uF 20% 16V
C54	1-124-589-11	s	ELECT 47uF 20% 16V
C55	1-163-035-00	s	CERAMIC 0.047uF 50V
C101	1-107-164-00	s	MICA 51PF 5% 50V
C102	1-124-584-00	s	ELECT 100uF 20% 10V
C103	1-126-157-11	s	ELECT 10uF 20% 10V
C104	1-124-589-11	s	ELECT 47uF 20% 10V
C105	1-126-157-11	s	ELECT 10uF 20% 10V
C106	1-124-589-11	s	ELECT 47uF 20% 10V
#C107	1-107-207-00	s	MICA 16PF 5% 500V
C108	1-126-157-11	s	ELECT 10uF 20% 10V
C109	1-124-589-11	s	ELECT 47uF 20% 16V
C110	1-163-035-00	s	CERAMIC 0.047uF 50V
C111	1-124-589-11	s	ELECT 47uF 20% 16V
C112	1-163-035-00	s	CERAMIC 0.047uF 50V
C113	1-126-157-11	s	ELECT 10uF 20% 10V
C114	1-130-499-00	s	MYLAR 0.22uF 5% 50V
C115	1-124-589-11	s	ELECT 47uF 20% 16V
C116	1-163-035-00	s	CERAMIC 0.047uF 50V
#C117	1-131-365-00	s	TANTALUM 10uF 10% 16V
C118	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C119	1-107-210-00	s	MICA 22PF 5% 500V
C120	1-107-036-00	s	MICA 68PF 5% 500V
C121	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C122	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C123	1-107-158-00	s	MICA 30PF 5% 500V
C124	1-107-158-00	s	MICA 30PF 5% 500V
C125	1-163-035-00	s	CERAMIC 0.047uF 50V
C126	1-109-540-00	s	MICA 180PF 5% 50V
C127	1-163-035-00	s	CERAMIC 0.047uF 50V
C128	1-130-475-00	s	MYLAR 0.0022uF 5% 50V
C129	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C130	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C131	1-163-035-00	s	CERAMIC 0.047uF 50V
C132	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C133	1-124-589-11	s	ELECT 47uF 20% 16V
C134	1-163-035-00	s	CERAMIC 0.047uF 50V
C135	1-163-035-00	s	CERAMIC 0.047uF 50V
C136	1-124-589-11	s	ELECT 47uF 20% 10V

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C137	1-107-202-00	s	MICA 10PF 5% 500V
C138	1-109-633-00	s	MICA 470PF 1% 500V
#C139	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C140	1-107-026-00	s	MICA 5.1PF 0.5PF 500V
C141	1-126-157-11	s	ELECT 10uF 20% 10V
C142	1-163-035-00	s	CERAMIC 0.047uF 50V
C143	1-163-035-00	s	CERAMIC 0.047uF 50V
C144	1-124-589-11	s	ELECT 47uF 20% 16V
C150	1-124-584-00	s	ELECT 100uF 20% 10V
C151	1-107-158-00	s	MICA 30PF 5% 500V
C152	1-124-584-00	s	ELECT 100uF 20% 6.3V
C201	1-126-157-11	s	ELECT 10uF 20% 16V
C202	1-163-035-00	s	CERAMIC 0.047uF 50V
C203	1-163-035-00	s	CERAMIC 0.047uF 50V
C204	1-107-159-00	s	MICA 33PF 5% 500V
C205	1-126-160-11	s	ELECT 1uF 20% 50V
C206	1-126-160-11	s	ELECT 1uF 20% 50V
C207	1-107-159-00	s	MICA 33PF 5% 500V
C208	1-124-589-11	s	ELECT 47uF 20% 16V
C209	1-163-035-00	s	CERAMIC 0.047uF 50V
C210	1-124-589-11	s	ELECT 47uF 20% 16V
C211	1-163-035-00	s	CERAMIC 0.047uF 50V
C212	1-163-035-00	s	CERAMIC 0.047uF 50V
C213	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C214	1-163-035-00	s	CERAMIC 0.047uF 50V
C215	1-124-589-11	s	ELECT 47uF 20% 16V
C216	1-130-475-00	s	MYLAR 0.0022uF 5% 50V
C217	1-163-035-00	s	CERAMIC 0.047uF 50V
C218	1-163-035-00	s	CERAMIC 0.047uF 50V
C219	1-109-627-00	s	MICA 150PF 5% 50V
C220	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C221	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C222	1-107-085-00	s	MICA 100PF 5% 50V
C223	1-163-035-00	s	CERAMIC 0.047uF 50V
C224	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C225	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C226	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C227	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C228	1-109-627-00	s	MICA 150PF 5% 50V
C229	1-107-085-00	s	MICA 100PF 5% 50V
C230	1-107-084-00	s	MICA 91PF 5% 50V
C231	1-162-732-11	s	CERAMIC 820PF 5% 50V
C232	1-124-589-11	s	ELECT 47uF 20% 16V
C233	1-163-035-00	s	CERAMIC 0.047uF 50V
C234	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C235	1-163-035-00	s	CERAMIC 0.047uF 50V
C236	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C250	1-126-157-11	s	ELECT 10uF 20% 10V
C251	1-126-157-11	s	ELECT 10uF 20% 10V
C252	1-163-035-00	s	CERAMIC 0.047uF 50V
C253	1-164-161-11	s	CERAMIC 0.0022uF 10% 50V
C254	1-163-017-00	s	CERAMIC 0.0047uF 10% 50V
C255	1-107-169-00	s	MICA 100PF 5% 500V
C256	1-107-043-00	s	MICA 2.7PF 0.5PF 500V
C257	1-107-204-00	s	MICA 12PF 5% 500V

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C258	1-107-204-00	s	MICA 12PF 5% 500V
C259	1-107-159-00	s	MICA 33PF 5% 500V
C260	1-107-159-00	s	MICA 33PF 5% 500V
C261	1-107-159-00	s	MICA 33PF 5% 500V
C262	1-107-159-00	s	MICA 33PF 5% 500V
C263	1-163-011-11	s	CERAMIC 0.0015uF 10% 50V
C271	1-107-157-00	s	MICA 27PF 5% 500V
C272	1-107-157-00	s	MICA 27PF 5% 500V
#C273	1-107-202-00	s	MICA 10PF 5% 500V
C302	1-109-633-00	s	MICA 470PF 1% 500V
C304	1-124-584-00	s	ELECT 100uF 20% 10V
C305	1-124-584-00	s	ELECT 100uF 20% 10V
C307	1-163-035-00	s	CERAMIC 0.047uF 50V
C308	1-124-589-11	s	ELECT 47uF 20% 16V
C309	1-163-035-00	s	CERAMIC 0.047uF 50V
C310	1-124-584-00	s	ELECT 100uF 20% 10V
C311	1-124-584-00	s	ELECT 100uF 20% 10V
C314	1-107-206-00	s	MICA 15PF 5% 500V
C315	1-107-210-00	s	MICA 22PF 5% 500V
C316	1-124-257-00	s	ELECT 2.2uF 20% 50V
C317	1-124-257-00	s	ELECT 2.2uF 20% 50V
C318	1-124-589-11	s	ELECT 47uF 20% 16V
C319	1-163-035-00	s	CERAMIC 0.047uF 50V
C320	1-124-589-11	s	ELECT 47uF 20% 16V
C321	1-163-035-00	s	CERAMIC 0.047uF 50V
C322	1-124-589-11	s	ELECT 47uF 20% 10V
C323	1-124-589-11	s	ELECT 47uF 20% 10V
C324	1-124-589-11	s	ELECT 47uF 20% 10V
C325	1-163-035-00	s	CERAMIC 0.047uF 50V
C326	1-124-584-00	s	ELECT 100uF 20% 10V
C327	1-124-584-00	s	ELECT 100uF 20% 10V
C328	1-107-164-00	s	MICA 51PF 5% 500V
C331	1-163-038-00	s	CERAMIC 0.1uF 25V
#C332	1-163-035-00	s	CERAMIC 0.047uF 50V
#C333	1-124-589-11	s	ELECT 47uF 20% 16V
#C334	1-107-211-00	s	MICA 24PF 5% 500V
C335	1-163-035-00	s	CERAMIC 0.047uF 50V
C336	1-163-035-00	s	CERAMIC 0.047uF 50V
C401	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C402	1-109-542-00	s	MICA 220PF 5% 50V
C403	1-126-157-11	s	ELECT 10uF 20% 10V
C404	1-126-157-11	s	ELECT 10uF 20% 10V
C405	1-163-038-00	s	CERAMIC 0.1uF 25V
C406	1-124-589-11	s	ELECT 47uF 20% 16V
C407	1-163-035-00	s	CERAMIC 0.047uF 50V
C408	1-124-584-00	s	ELECT 100uF 20% 10V
C409	1-163-035-00	s	CERAMIC 0.047uF 50V
C410	1-163-035-00	s	CERAMIC 0.047uF 50V
C411	1-107-157-00	s	MICA 27PF 5% 500V
C412	1-124-589-11	s	ELECT 47uF 20% 16V
#C413	1-130-474-00	s	MYLAR 0.0018uF 5% 50V
C414	1-164-232-11	s	CERAMIC 0.01uF 10% 50V
C416	1-124-234-00	s	ELECT 22uF 20% 16V
C417	1-163-038-00	s	CERAMIC 0.1uF 25V
C419	1-107-075-00	s	MICA 39PF 5% 50V

Note: For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
#C420	1-163-035-00	s	CERAMIC 0.047uF 50V
C421	1-163-035-00	s	CERAMIC 0.047uF 50V
C422	1-163-035-00	s	CERAMIC 0.047uF 50V
C423	1-124-589-11	s	ELECT 47uF 20% 16V
C424	1-124-589-11	s	ELECT 47uF 20% 16V
C425	1-163-035-00	s	CERAMIC 0.047uF 50V
C426	1-124-257-00	s	ELECT 2.2uF 20% 50V
C427	1-163-038-00	s	CERAMIC 0.1uF 25V
C430	1-130-477-00	s	MYLAR 0.0033uF 5% 50V
C431	1-163-035-00	s	CERAMIC 0.047uF 50V
C432	1-107-162-00	s	MICA 43PF 5% 500V
C433	1-163-035-00	s	CERAMIC 0.047uF 50V
C434	1-107-165-00	s	MICA 56PF 5% 50V
C435	1-107-206-00	s	MICA 15PF 5% 500V
C440	1-163-035-00	s	CERAMIC 0.047uF 50V
C441	1-163-038-00	s	CERAMIC 0.1uF 25V
C442	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C443	1-107-077-00	s	MICA 47PF 5% 50V
#C444	1-126-157-11	s	ELECT 10uF 20% 16V
C445	1-126-157-11	s	ELECT 10uF 20% 16V
C501	1-107-085-00	s	MICA 100PF 5% 50V
C502	1-126-157-11	s	ELECT 10uF 20% 10V
C503	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C504	1-124-589-11	s	ELECT 47uF 20% 16V
C505	1-126-157-11	s	ELECT 10uF 20% 10V
C506	1-126-157-11	s	ELECT 10uF 20% 10V
C507	1-163-035-00	s	CERAMIC 0.047uF 50V
C508	1-126-157-11	s	ELECT 10uF 20% 10V
C509	1-126-157-11	s	ELECT 10uF 20% 10V
C510	1-126-157-11	s	ELECT 10uF 20% 10V
C511	1-126-157-11	s	ELECT 10uF 20% 10V
#C512	1-126-157-11	s	ELECT 10 20% 16V
#C513	1-126-157-11	s	ELECT 10 20% 16V
#C514	1-126-157-11	s	ELECT 10 20% 16V
#C515	1-126-157-11	s	ELECT 10 20% 16V
C516	1-124-589-11	s	ELECT 47uF 20% 16V
C517	1-163-035-00	s	CERAMIC 0.047uF 50V
C518	1-107-085-00	s	MICA 100PF 5% 50V
C523	1-163-023-00	s	CERAMIC 0.015uF 10% 50V
C525	1-163-035-00	s	CERAMIC 0.047uF 50V
C526	1-124-589-11	s	ELECT 47uF 20% 16V
C552	1-126-157-11	s	ELECT 10uF 20% 10V
C553	1-124-589-11	s	ELECT 47uF 20% 16V
C554	1-163-038-00	s	CERAMIC 0.1uF 25V
C555	1-162-728-11	s	CERAMIC 560PF 5% 50V
C556	1-130-478-00	s	MYLAR 0.0039uF 5% 50V
C557	1-124-234-00	s	ELECT 22uF 20% 10V
C558	1-163-035-00	s	CERAMIC 0.047uF 50V
C559	1-126-157-11	s	ELECT 10uF 20% 10V
CN601	1-506-468-11	s	PIN, CONNECTOR 3P
CN602	1-564-013-11	o	PIN, CONNECTOR 3P
CN603	1-506-469-11	s	PIN, CONNECTOR 4P
CN604	1-506-469-11	s	PIN, CONNECTOR 4P
CN606	1-506-470-11	s	PIN, CONNECTOR 5P

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Ref. No. or Q'ty	Part No.	SP	Description
CN607	1-564-009-11	o	PIN, CONNECTOR 10P
CN608	1-564-002-41	s	PIN, CONNECTOR 3P
CN609	1-506-469-11	s	PIN, CONNECTOR 4P
CN610	1-506-469-11	s	PIN, CONNECTOR 4P
CN611	1-506-468-11	s	PIN, CONNECTOR 3P
CN612	1-506-469-11	s	PIN, CONNECTOR 4P
CN613	1-564-005-11	o	PIN, CONNECTOR 6P
CN614	1-506-472-11	s	PIN, CONNECTOR 7P
CN615	1-506-475-11	s	PIN, CONNECTOR 10P
CN616	1-506-468-11	s	PIN, CONNECTOR 3P
CN617	1-506-468-11	s	PIN, CONNECTOR 3P
CN618	1-564-004-11	o	PIN, CONNECTOR 5P
#CN619	1-562-957-11	o	CONNECTOR, PB (SOCKET) 10P
CN620	1-506-468-11	s	PIN, CONNECTOR 3P
CN621	1-506-485-11	s	PIN, CONNECTOR 6P
#CN622	1-562-482-11	o	CONNECTOR 20P
#CN623	1-564-680-11	s	PIN, CONNECTOR 10P
#CN624	1-564-680-11	s	PIN, CONNECTOR 10P
#CN625	1-564-680-11	s	PIN, CONNECTOR 10P
CN626	1-564-680-11	s	PIN, CONNECTOR 10P
CN627	1-566-095-11	s	PIN, BOARD TO BOARD 10P
CN628	1-506-467-11	s	PIN, CONNECTOR 2P
#CV301	1-141-407-11	s	CAP, CERAMIC TRIMMER
#CV302	1-141-407-11	s	CAP, CERAMIC TRIMMER
D1	8-719-911-19	s	DIODE 1SS119
D2	8-719-911-19	s	DIODE 1SS119
D3	8-719-109-60	s	DIODE RD2.7ES-B2
D4	8-719-911-19	s	DIODE 1SS119
D101	8-719-101-98	s	DIODE 1SS97-1
D102	8-719-101-98	s	DIODE 1SS97-1
D103	8-719-911-19	s	DIODE 1SS119
D104	8-719-109-72	s	DIODE RD3.9ES-B2
D105	8-719-911-19	s	DIODE 1SS119
D106	8-719-911-19	s	DIODE 1SS119
D107	8-719-911-19	s	DIODE 1SS119
D108	8-719-911-19	s	DIODE 1SS119
D201	8-719-812-41	s	DIODE TLR124
#D202	8-719-911-19	s	DIODE 1SS119
D401	8-719-911-19	s	DIODE 1SS119
D501	8-719-400-18	s	DIODE MA152WK
D502	8-719-400-18	s	DIODE MA152WK
D503	8-719-400-18	s	DIODE MA152WK
D504	8-719-400-18	s	DIODE MA152WK
DL101	1-415-403-11	s	DELAY LINE 1000nS
DL201	1-415-154-00	s	DELAY LINE 35nS
DL202	1-415-154-00	s	DELAY LINE 35nS
DL301	1-415-553-11	s	DELAY LINE 1H
DL401	1-415-402-11	s	DELAY LINE 10nS
DL551	1-415-402-11	s	DELAY LINE 10nS
FL101	1-235-009-21	s	FILTER, HIGH PASS (HPD-MD)
FL102	1-235-477-11	s	FILTER, HIGH PASS
#FL103	1-409-410-11	s	FILTER, TRAP
FL201	1-235-478-11	s	FILTER, HIGH PASS
FL202	1-235-010-21	s	FILTER, HIGH PASS (HPF-DM)

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
FL301	1-235-600-11	s	FILTER, LOW PASS
FL302	1-235-575-11	s	FILTER, LOW PASS
FL401	1-235-473-11	s	FILTER, LOW PASS
IC1	8-759-008-79	s	IC MC14011BF (MOTOROLA)
IC2	8-759-200-90	s	IC TC4538BF (TOSHIBA)
IC101	8-751-870-00	s	IC CX187 (SONY)
IC102	8-759-206-29	s	IC TA7060AP-SONY (SONY)
IC103	8-759-206-29	s	IC TA7060AP-SONY (SONY)
IC104	8-741-125-70	s	IC BX1257 (SONY)
IC105	8-752-006-12	s	IC CX20061 (SONY)
IC201	8-752-004-50	s	IC CX20045 (SONY)
IC202	8-741-125-40	s	IC BX1254 (SONY)
IC203	8-741-125-30	s	IC BX1253 (SONY)
IC204	8-741-114-03	S	IC BX1140 (SONY)
IC205	8-752-006-12	s	IC CX20061 (SONY)
IC206	8-759-400-06	s	IC AN608P (SONY)
IC207	8-759-708-05	s	IC NJM78L05A (JRC)
IC301	8-752-006-00	s	IC CX20060 (SONY)
IC302	8-759-400-06	s	IC AN608P (SONY)
IC303	8-759-168-20	s	IC RC78L09A (RAYTHEON)
IC304	8-743-949-01	S	IC BX3949A (SONY)
IC401	8-759-201-35	s	IC TA7672P (TOSHIBA)
IC402	8-741-124-70	s	IC BX1247 (SONY)
IC403	8-752-006-12	s	IC CX20061 (SONY)
IC404	8-741-125-80	s	IC BX1258 (SONY)
IC501	8-752-006-12	s	IC CX20061 (SONY)
IC502	8-759-969-13	s	IC SN16913P (TI)
#IC503	8-759-145-58	s	IC UPC4558C (NEC)
IC551	8-741-124-70	s	IC BX1247 (SONY)
L2	1-407-169-XX	s	INDUCTOR 100uH
L3	1-408-948-00	s	INDUCTOR 220uH
#L4	1-421-329-00	s	COIL, CHOKE
L101	1-408-984-21	s	INDUCTOR 150uH
L102	1-408-986-21	s	INDUCTOR 270uH
#L103	1-408-981-21	s	INDUCTOR 82uH
L104	1-407-504-00	s	INDUCTOR 10mH
L105	1-407-169-XX	s	INDUCTOR 100uH
L106	1-408-972-21	s	INDUCTOR 15uH
L107	1-408-984-21	s	INDUCTOR 150uH
#L108	1-407-171-00	s	INDUCTOR 150uH
L201	1-407-169-XX	s	INDUCTOR 100uH
L202	1-407-169-XX	s	INDUCTOR 100uH
L203	1-408-980-21	s	INDUCTOR 68uH
L204	1-408-984-21	s	INDUCTOR 150uH
L205	1-408-972-21	s	INDUCTOR 15uH
L206	1-408-976-21	s	INDUCTOR 33uH
L207	1-407-169-XX	s	INDUCTOR 100uH
L208	1-408-973-21	s	INDUCTOR 18uH
L214	1-408-978-21	s	INDUCTOR 47uH
L215	1-408-968-21	s	INDUCTOR 6.8uH
L301	1-408-978-21	s	INDUCTOR 47uH
L302	1-407-169-XX	s	INDUCTOR 100uH
L303	1-407-169-XX	s	INDUCTOR 100uH
L304	1-408-958-21	s	INDUCTOR 1uH

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Ref. No. or Q'ty	Part No.	SP	Description
L305	1-408-958-21	s	INDUCTOR 1uH
L306	1-407-169-XX	s	INDUCTOR 100uH
L307	1-407-169-XX	s	INDUCTOR 100uH
L308	1-408-975-21	s	INDUCTOR 27uH
L309	1-407-169-XX	s	INDUCTOR 100uH
L401	1-407-492-00	s	INDUCTOR 1mH
L402	1-408-984-21	s	INDUCTOR 150uH
L404	1-408-966-21	s	INDUCTOR 4.7uH
#L405	1-407-163-00	s	INDUCTOR 33uH
#L406	1-407-163-00	s	INDUCTOR 33uH
L501	1-408-989-21	s	INDUCTOR 470uH
L551	1-407-492-00	s	INDUCTOR 1mH
LV201	1-407-570-00	s	COIL, VARIABLE 15uH
LV202	1-407-570-00	s	COIL, VARIABLE 15uH
LV203	1-407-569-00	s	COIL, VARIABLE 10uH
Q1	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q2	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q3	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q4	8-729-216-22	s	TRANSISTOR 2SA1162G
Q6	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q7	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q51	8-729-140-93	s	TRANSISTOR 2SB733-34
#Q52	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q101	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q102	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q103	8-729-216-22	s	TRANSISTOR 2SA1162G
Q104	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q105	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q106	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q107	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q108	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q109	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q110	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q111	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q112	8-729-216-22	s	TRANSISTOR 2SA1162G
Q113	8-729-216-22	s	TRANSISTOR 2SA1162G
Q114	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q115	8-729-216-22	s	TRANSISTOR 2SA1162G
Q116	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q117	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q118	8-729-216-22	s	TRANSISTOR 2SA1162G
Q119	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q120	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q121	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q122	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q123	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q124	8-729-230-49	s	TRANSISTOR 2SC2712-YG
#Q125	8-729-230-49	s	TRANSISTOR 2SC2712-YG
#Q191	8-729-901-01	s	TRANSISTOR DTC144EK
Q201	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q202	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q203	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q204	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q205	8-729-175-72	s	TRANSISTOR 2SC2757
Q206	8-729-230-49	s	TRANSISTOR 2SC2712-YG

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q207	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q208	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q209	8-729-230-49	s	TRANSISTOR 2SC2712-YG
#Q210	8-729-119-78	s	tRANSISTOR 2SC2785-HFE
#Q213	8-729-107-45	s	TRANSISTOR 2SD1030-STX
#Q215	8-729-107-45	s	TRANSISTOR 2SD1030-STX
Q301	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q302	8-729-216-22	s	TRANSISTOR 2SA1162G
Q303	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q304	8-729-216-22	s	TRANSISTOR 2SA1162G
Q306	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q307	8-729-216-22	s	TRANSISTOR 2SA1162G
Q401	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q402	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q403	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q404	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q405	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q406	8-729-231-55	s	TRANSISTOR 2SC2878-B
Q407	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q408	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q409	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q410	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q412	8-729-216-22	s	TRANSISTOR 2SA1162G
Q501	8-729-230-49	s	TRANSISTOR 2SC2712-YG
#Q502	8-729-400-76	s	TRANSISTOR 2SD1030
#Q503	8-729-231-55	s	TRANSISTOR 2SC2878-B
Q551	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q552	8-729-230-49	s	TRANSISTOR 2SC2712-YG
R1	1-216-081-00	s	METAL 22K 5% 1/10W
R2	1-216-057-00	s	METAL 2.2K 5% 1/10W
R3	1-216-057-00	s	METAL 2.2K 5% 1/10W
R4	1-216-061-00	s	METAL 3.3K 5% 1/10W
R5	1-216-009-00	s	METAL 22 5% 1/10W
R6	1-216-049-00	s	METAL 1K 5% 1/10W
R7	1-216-059-00	s	METAL 2.7K 5% 1/10W
R8	1-216-081-00	s	METAL 22K 5% 1/10W
R9	1-216-081-00	s	METAL 22K 5% 1/10W
R10	1-216-065-00	s	METAL 4.7K 5% 1/10W
R13	1-216-059-00	s	METAL 2.7K 5% 1/10W
#R15	1-216-071-00	s	METAL 8.2K 5% 1/10W
R16	1-216-059-00	s	METAL 2.7K 5% 1/10W
R17	1-216-081-00	s	METAL 22K 5% 1/10W
R18	1-216-081-00	s	METAL 22K 5% 1/10W
R19	1-216-073-00	s	METAL 10K 5% 1/10W
R20	1-216-073-00	s	METAL 10K 5% 1/10W
R21	1-216-073-00	s	METAL 10K 5% 1/10W
R22	1-216-057-00	s	METAL 2.2K 5% 1/10W
R23	1-215-459-00	s	METAL 39K 1% 1/4W
R24	1-216-073-00	s	METAL 10K 5% 1/10W
R25	1-215-470-00	s	METAL 110K 1% 1/4W
R26	1-216-075-00	s	METAL 12K 5% 1/10W
R27	1-216-057-00	s	METAL 2.2K 5% 1/10W
R28	1-216-057-00	s	METAL 2.2K 5% 1/10W
R29	1-216-073-00	s	METAL 10K 5% 1/10W
R30	1-216-073-00	s	METAL 10K 5% 1/10W
R31	1-216-065-00	s	METAL 4.7K 5% 1/10W
R32	1-216-013-00	s	METAL 33 5% 1/10W
R34	1-216-017-00	s	METAL 47 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R35	1-216-017-00	s	METAL 47 5% 1/10W
R36	1-216-017-00	s	METAL 47 5% 1/10W
#R37	1-216-073-00	s	METAL 10K 5% 1/10W
#R38	1-216-017-00	s	METAL 47 5% 1/10W
R51	1-216-065-00	s	METAL 4.7K 5% 1/10W
R52	1-216-073-00	s	METAL 10K 5% 1/10W
R53	1-216-043-00	s	METAL 560 5% 1/10W
R54	1-215-394-00	s	METAL 75 1% 1/4W
R55	1-215-394-00	s	METAL 75 1% 1/4W
R101	1-215-408-00	s	METAL 300 1% 1/4W
R102	1-216-069-00	s	METAL 6.8K 5% 1/10W
R103	1-215-416-00	s	METAL 620 1% 1/4W
R104	1-216-057-00	s	METAL 2.2K 5% 1/10W
R105	1-216-053-00	s	METAL 1.5K 5% 1/10W
R106	1-216-053-00	s	METAL 1.5K 5% 1/10W
#R107	1-216-026-00	s	METAL 110 5% 1/10W
#R108	1-216-046-00	s	METAL 750 5% 1/10W
R109	1-216-057-00	s	METAL 2.2K 5% 1/10W
#R110	1-216-058-00	s	METAL 2.4K 5% 1/10W
R111	1-216-025-00	s	METAL 100 5% 1/10W
R112	1-216-057-00	s	METAL 2.2K 5% 1/10W
R113	1-216-069-00	s	METAL 6.8K 5% 1/10W
R114	1-216-057-00	s	METAL 2.2K 5% 1/10W
R115	1-216-081-00	s	METAL 22K 5% 1/10W
R116	1-216-065-00	s	METAL 4.7K 5% 1/10W
R117	1-216-073-00	s	METAL 10K 5% 1/10W
R118	1-216-097-00	s	METAL 100K 5% 1/10W
R119	1-216-091-00	s	METAL 56K 5% 1/10W
R120	1-215-442-00	s	METAL 7.5K 1% 1/4W
R121	1-216-053-00	s	METAL 1.5K 5% 1/10W
R122	1-215-397-00	s	METAL 100 1% 1/4W
R123	1-216-025-00	s	METAL 100 5% 1/10W
R125	1-216-041-00	s	METAL 470 5% 1/10W
R126	1-216-041-00	s	METAL 470 5% 1/10W
R127	1-216-081-00	s	METAL 22K 5% 1/10W
R128	1-216-081-00	s	METAL 22K 5% 1/10W
R130	1-216-081-00	s	METAL 22K 5% 1/10W
R131	1-215-414-00	s	METAL 510 1% 1/4W
R132	1-216-057-00	s	METAL 2.2K 5% 1/10W
R133	1-215-406-00	s	METAL 240 1% 1/4W
R134	1-216-073-00	s	METAL 10K 5% 1/10W
R135	1-216-039-00	s	METAL 390 5% 1/10W
R136	1-215-414-00	s	METAL 510 1% 1/4W
R137	1-216-081-00	s	METAL 22K 5% 1/10W
R138	1-216-079-00	s	METAL 18K 5% 1/10W
R139	1-216-073-00	s	METAL 10K 5% 1/10W
R140	1-216-041-00	s	METAL 470 5% 1/10W
R141	1-216-051-00	s	METAL 1.2K 5% 1/10W
R143	1-215-487-00	s	METAL 560K 1% 1/4W
R144	1-216-051-00	s	METAL 1.2K 5% 1/10W
R145	1-216-041-00	s	METAL 470 5% 1/10W
R146	1-216-049-00	s	METAL 1K 5% 1/10W
R147	1-216-029-00	s	METAL 150 5% 1/10W
R148	1-215-424-00	s	METAL 1.3K 1% 1/4W
R149	1-215-408-00	s	METAL 300 1% 1/4W

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R150	1-216-041-00	s	METAL 470 5% 1/10W
#R151	1-216-047-00	s	METAL 820 5% 1/10W
R152	1-216-051-00	s	METAL 1.2K 5% 1/10W
R153	1-216-053-00	s	METAL 1.5K 5% 1/10W
R154	1-216-065-00	s	METAL 4.7K 5% 1/10W
R155	1-216-053-00	s	METAL 1.5K 5% 1/10W
R156	1-216-081-00	s	METAL 22K 5% 1/10W
R157	1-216-089-91	s	METAL 47K 5% 1/10W
R158	1-216-061-00	s	METAL 3.3K 5% 1/10W
R159	1-216-055-00	s	METAL 1.8K 5% 1/10W
R160	1-216-073-00	s	METAL 10K 5% 1/10W
R161	1-216-059-00	s	METAL 2.7K 5% 1/10W
R162	1-216-089-91	s	METAL 47K 5% 1/10W
R163	1-216-073-00	s	METAL 10K 5% 1/10W
R164	1-216-065-00	s	METAL 4.7K 5% 1/10W
#R165	1-216-073-00	s	METAL 10K 5% 1/10W
#R166	1-216-075-00	s	METAL 12K 5% 1/10W
R167	1-216-085-00	s	METAL 33K 5% 1/10W
R168	1-216-085-00	s	METAL 33K 5% 1/10W
R169	1-216-085-00	s	METAL 33K 5% 1/10W
R170	1-216-073-00	s	METAL 10K 5% 1/10W
R171	1-216-065-00	s	METAL 4.7K 5% 1/10W
R172	1-216-035-00	s	METAL 270 5% 1/10W
R173	1-216-073-00	s	METAL 10K 5% 1/10W
R174	1-216-033-00	s	METAL 220 5% 1/10W
R175	1-216-081-00	s	METAL 22K 5% 1/10W
R176	1-215-416-00	s	METAL 620 1% 1/4W
R177	1-216-085-00	s	METAL 33K 5% 1/10W
R178	1-216-073-00	s	METAL 10K 5% 1/10W
#R179	1-216-049-00	s	METAL 1K 5% 1/10W
#R180	1-216-057-00	s	METAL 2.2K 5% 1/10W
R201	1-216-043-00	s	METAL 560 5% 1/10W
R202	1-216-043-00	s	METAL 560 5% 1/10W
R203	1-216-085-00	s	METAL 33K 5% 1/10W
R204	1-216-085-00	s	METAL 33K 5% 1/10W
R205	1-216-073-00	s	METAL 10K 5% 1/10W
R206	1-216-073-00	s	METAL 10K 5% 1/10W
R207	1-216-043-00	s	METAL 560 5% 1/10W
R208	1-216-043-00	s	METAL 560 5% 1/10W
R209	1-216-075-00	s	METAL 12K 5% 1/10W
R211	1-216-065-00	s	METAL 4.7K 5% 1/10W
R212	1-216-053-00	s	METAL 1.5K 5% 1/10W
R213	1-215-414-00	s	METAL 510 1% 1/4W
R214	1-215-405-00	s	METAL 220 1% 1/4W
R215	1-216-065-00	s	METAL 4.7K 5% 1/10W
R216	1-216-081-00	s	METAL 22K 5% 1/10W
R217	1-215-434-00	s	METAL 3.6K 1% 1/4W
R218	1-216-047-00	s	METAL 820 5% 1/10W
R219	1-216-085-00	s	METAL 33K 5% 1/10W
R220	1-216-085-00	s	METAL 33K 5% 1/10W
R221	1-216-081-00	s	METAL 22K 5% 1/10W
R223	1-216-081-00	s	METAL 22K 5% 1/10W
R224	1-216-079-00	s	METAL 18K 5% 1/10W
#R225	1-215-416-00	s	METAL 620 1% 1/6W
#R226	1-215-422-00	s	METAL 1.1K 1% 1/4W

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R227	1-216-049-00	s	METAL 1K 5% 1/10W
R228	1-215-415-00	s	METAL 560 1% 1/4W
R229	1-216-013-00	s	METAL 33 5% 1/10W
R230	1-216-085-00	s	METAL 33K 5% 1/10W
R231	1-216-065-00	s	METAL 4.7K 5% 1/10W
R232	1-216-065-00	s	METAL 4.7K 5% 1/10W
R233	1-216-057-00	s	METAL 2.2K 5% 1/10W
R234	1-216-073-00	s	METAL 10K 5% 1/10W
R235	1-216-073-00	s	METAL 10K 5% 1/10W
R236	1-216-049-00	s	METAL 1K 5% 1/10W
R237	1-216-051-00	s	METAL 1.2K 5% 1/10W
R239	1-215-394-00	s	METAL 75 1% 1/4W
R240	1-216-041-00	s	METAL 470 5% 1/10W
R241	1-216-073-00	s	METAL 10K 5% 1/10W
R242	1-215-428-00	s	METAL 2K 1% 1/4W
R243	1-216-073-00	s	METAL 10K 5% 1/10W
R244	1-216-073-00	s	METAL 10K 5% 1/10W
#R245	1-216-043-00	s	METAL 560 5% 1/10W
R246	1-216-043-00	s	METAL 560 5% 1/10W
R247	1-216-051-00	s	METAL 1.2K 5% 1/10W
R248	1-216-061-00	s	METAL 3.3K 5% 1/10W
R249	1-216-049-00	s	METAL 1K 5% 1/10W
R250	1-216-073-00	s	METAL 10K 5% 1/10W
#R252	1-247-825-00	s	CARBON 560 5% 1/6W
#R253	1-216-081-00	s	METAL 22K 5% 1/10W
#R254	1-216-081-00	s	METAL 22K 5% 1/10W
#R255	1-216-081-00	s	METAL 22K 5% 1/10W
R301	1-215-408-00	s	METAL 300 1% 1/4W
R302	1-215-424-00	s	METAL 1.3K 1% 1/4W
R303	1-215-414-00	s	METAL 510 1% 1/4W
R304	1-215-414-00	s	METAL 510 1% 1/4W
R305	1-215-421-00	s	METAL 1K 1% 1/4W
R306	1-215-421-00	s	METAL 1K 1% 1/4W
R307	1-216-057-00	s	METAL 2.2K 5% 1/10W
R313	1-215-422-00	s	METAL 1.1K 1% 1/4W
R314	1-216-079-00	s	METAL 18K 5% 1/10W
R315	1-215-428-00	s	METAL 2K 1% 1/4W
R316	1-216-061-00	s	METAL 3.3K 5% 1/10W
R317	1-216-081-00	s	METAL 22K 5% 1/10W
R318	1-215-422-00	s	METAL 1.1K 1% 1/4W
R321	1-215-421-00	s	METAL 1K 1% 1/4W
R322	1-215-420-00	s	METAL 910 1% 1/4W
R323	1-216-057-00	s	METAL 2.2K 5% 1/10W
R324	1-216-085-00	s	METAL 33K 5% 1/10W
#R325	1-216-089-91	s	METAL 47K 5% 1/10W
R326	1-216-061-00	s	METAL 3.3K 5% 1/10W
R327	1-216-049-00	s	METAL 1K 5% 1/10W
R329	1-216-081-00	s	METAL 22K 5% 1/10W
R330	1-216-075-00	s	METAL 12K 5% 1/10W
R331	1-215-419-00	s	METAL 820 1% 1/4W
R332	1-216-049-00	s	METAL 1K 5% 1/10W
R333	1-216-061-00	s	METAL 3.3K 5% 1/10W
R334	1-216-049-00	s	METAL 1K 5% 1/10W
#R335	1-216-065-00	s	METAL 4.7K 5% 1/10W
R401	1-216-025-00	s	METAL 100 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R402	1-216-073-00	s	METAL 10K 5% 1/10W
R403	1-215-445-00	s	METAL 10K 1% 1/4W
R405	1-216-065-00	s	METAL 4.7K 5% 1/10W
R406	1-216-047-00	s	METAL 820 5% 1/10W
R407	1-216-079-00	s	METAL 18K 5% 1/10W
R408	1-216-073-00	s	METAL 10K 5% 1/10W
R409	1-216-065-00	s	METAL 4.7K 5% 1/10W
R410	1-216-069-00	s	METAL 6.8K 5% 1/10W
R411	1-216-049-00	s	METAL 1K 5% 1/10W
#R412	1-215-431-00	s	METAL 2.7K 1% 1/4W
R413	1-216-051-00	s	METAL 1.2K 5% 1/10W
R414	1-216-065-00	s	METAL 4.7K 5% 1/10W
R415	1-216-077-00	s	METAL 15K 5% 1/10W
R416	1-216-059-00	s	METAL 2.7K 5% 1/10W
R417	1-216-049-00	s	METAL 1K 5% 1/10W
R418	1-216-041-00	s	METAL 470 5% 1/10W
R419	1-216-049-00	s	METAL 1K 5% 1/10W
#R420	1-216-295-00	s	METAL 0 5% 1/10W
R421	1-216-063-00	s	METAL 3.9K 5% 1/10W
R423	1-216-043-00	s	METAL 560 5% 1/10W
R424	1-216-079-00	s	METAL 18K 5% 1/10W
R425	1-216-043-00	s	METAL 560 5% 1/10W
R426	1-216-097-00	s	METAL 100K 5% 1/10W
R427	1-215-460-00	s	METAL 43K 1% 1/4W
R428	1-216-073-00	s	METAL 10K 5% 1/10W
R429	1-216-081-00	s	METAL 22K 5% 1/10W
R430	1-216-085-00	s	METAL 33K 5% 1/10W
R431	1-216-085-00	s	METAL 33K 5% 1/10W
R432	1-216-027-00	s	METAL 120 5% 1/10W
R433	1-216-057-00	s	METAL 2.2K 5% 1/10W
R434	1-216-049-00	s	METAL 1K 5% 1/10W
R435	1-216-073-00	s	METAL 10K 5% 1/10W
R436	1-216-073-00	s	METAL 10K 5% 1/10W
R437	1-216-057-00	s	METAL 2.2K 5% 1/10W
R438	1-216-075-00	s	METAL 12K 5% 1/10W
R439	1-216-067-00	s	METAL 5.6K 5% 1/10W
R440	1-215-421-00	s	METAL 1K 1% 1/4W
#R441	1-216-061-00	s	METAL 3.3K 5% 1/10W
R442	1-216-049-00	s	METAL 1K 5% 1/10W
R443	1-216-073-00	s	METAL 10K 5% 1/10W
R444	1-216-073-00	s	METAL 10K 5% 1/10W
R445	1-216-061-00	s	METAL 3.3K 5% 1/10W
R446	1-216-067-00	s	METAL 5.6K 5% 1/10W
R447	1-216-077-00	s	METAL 15K 5% 1/10W
R448	1-216-041-00	s	METAL 470 5% 1/10W
R449	1-216-049-00	s	METAL 1K 5% 1/10W
R450	1-216-049-00	s	METAL 1K 5% 1/10W
R451	1-215-424-00	s	METAL 1.3K 1% 1/4W
#R452	1-216-037-00	s	METAL 330 5% 1/10W
#R453	1-216-033-00	s	METAL 220 5% 1/10W
#R454	1-216-063-00	s	METAL 3.9K 5% 1/10W
#R455	1-216-049-00	s	METAL 1K 5% 1/10W
R501	1-216-081-00	s	METAL 22K 5% 1/10W
R502	1-216-081-00	s	METAL 22K 5% 1/10W
R503	1-216-071-00	s	METAL 8.2K 5% 1/10W

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R504	1-216-067-00	s	METAL 5.6K 5% 1/10W
R505	1-216-081-00	s	METAL 22K 5% 1/10W
R506	1-216-089-91	s	METAL 47K 5% 1/10W
R507	1-216-057-00	s	METAL 2.2K 5% 1/10W
R508	1-216-063-00	s	METAL 3.9K 5% 1/10W
R509	1-216-081-00	s	METAL 22K 5% 1/10W
#R510	1-216-081-00	s	METAL 22K 5% 1/10W
R511	1-216-051-00	s	METAL 1.2K 5% 1/10W
R512	1-216-057-00	s	METAL 2.2K 5% 1/10W
R513	1-216-025-00	s	METAL 100 5% 1/10W
#R514	1-216-073-00	s	METAL 10K 5% 1/10W
#R515	1-216-073-00	s	METAL 10K 5% 1/10W
#R516	1-216-097-00	s	META 100K 5% 1/10W
#R517	1-216-085-00	s	META 33K 5% 1/10W
#R519	1-216-089-00	s	META 47K 5% 1/10W
#R520	1-216-081-00	s	META 22K 5% 1/10W
#R521	1-216-097-00	s	META 100K 5% 1/10W
#R522	1-216-049-00	s	META 1K 5% 1/10W
#R523	1-216-067-00	s	META 5.6K 5% 1/10W
R524	1-216-065-00	s	METAL 4.7K 5% 1/10W
R525	1-216-097-00	s	METAL 100K 5% 1/10W
R551	1-216-049-00	s	METAL 1K 5% 1/10W
R553	1-216-049-00	s	METAL 1K 5% 1/10W
R554	1-216-041-00	s	METAL 470 5% 1/10W
R555	1-216-049-00	s	METAL 1K 5% 1/10W
R556	1-216-049-00	s	METAL 1K 5% 1/10W
R557	1-216-057-00	s	METAL 2.2K 5% 1/10W
R558	1-215-408-00	s	METAL 300 1% 1/4W
R559	1-215-426-00	s	METAL 1.6K 1% 1/4W
R560	1-216-049-00	s	METAL 1K 5% 1/10W
R561	1-216-013-00	s	METAL 33 5% 1/10W
R562	1-216-079-00	s	METAL 18K 5% 1/10W
R563	1-216-065-00	s	METAL 4.7K 5% 1/10W
#RV1	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV51	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV101	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV102	1-230-524-11	s	RES, ADJ, METAL GLAZE 22K
#RV103	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV104	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV105	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV106	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV107	1-230-528-11	s	RES, ADJ, METAL GLAZE 220K
#RV108	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV109	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV110	1-230-524-11	s	RES, ADJ, METAL GLAZE 22K
#RV111	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV201	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV202	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV203	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV204	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV205	1-230-524-11	s	RES, ADJ, METAL GLAZE 22K
#RV206	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV207	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV208	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV301	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV304	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV305	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV306	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(VO-12 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
#RV307	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV401	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV402	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#RV501	1-230-527-11	s	RES, ADJ, METAL GLAZE 100K
#RV502	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV503	1-228-889-00	s	RES, ADJ, METAL GLAZE 2.2K
#RV504	1-230-522-11	s	RES, ADJ, METAL GLAZE 4.7K
#S201	1-552-509-00	s	SWITCH, DIP
X301	1-567-142-11	s	OSCILLATOR, CRYSTAL

NR-16 BOARD

EK:S/N 11821 and higher

All of the component parts on the NR-16 board are supplied together when you order VO-12 board.

Ref. No. or Q'ty	Part No.	SP	Description
C701	1-161-051-00	s	CERAMIC 0.01uF 10% 25V
C702	1-161-051-00	s	CERAMIC 0.01uF 10% 25V
C703	1-161-051-00	s	CERAMIC 0.01uF 10% 25V
C704	1-161-051-00	s	CERAMIC 0.01uF 10% 25V
C705	1-161-051-00	s	CERAMIC 0.01uF 10% 25V
C706	1-124-589-11	s	ELECT 47uF 20% 16V
CN641	1-564-005-11	o	PIN, CONNECTOR 6P
D701	8-719-104-10	s	DIODE 1SS99
D702	8-719-104-10	s	DIODE 1SS99
D703	8-719-104-10	s	DIODE 1SS99
D704	8-719-104-10	s	DIODE 1SS99
E701	3-657-235-00	o	POINT, TEST
IC701	8-759-206-29	s	IC TA7060AP-SONY (SONY)
L701	1-408-423-00	s	INDUCTOR 150uH
R701	1-247-823-31	s	CARBON 470 5% 1/4W
R702	1-249-418-11	s	CARBON 1.2K 5% 1/4W
R703	1-249-420-11	s	CARBON 1.8K 5% 1/4W
R704	1-247-847-31	s	CARBON 4.7K 5% 1/4W
R705	1-247-807-31	s	CARBON 100 5% 1/4W
RV701	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
TP701	3-657-235-00	o	POINT, TEST

YC-20 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6711-651-A	o	MOUNTED CIRCUIT BOARD, YC-20
1pc	3-646-090-00	s	RIVET, NYLON
1pc	3-657-153-00	o	HINGE
8pcs	3-621-124-00	o	SPACER

(YC-20 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-163-035-00	s	CERAMIC 0.047uF 50V
C2	1-124-589-11	s	ELECT 47uF 20% 16V
C3	1-124-584-00	s	ELECT 100uF 20% 6.3V
C4	1-124-584-00	s	ELECT 100uF 20% 6.3V
C5	1-107-044-00	s	MICA 3.3PF 0.5PF 500V
C6	1-107-085-00	s	MICA 100PF 5% 50V
C7	1-107-166-00	s	MICA 62PF 5% 50V
C8	1-124-584-00	s	ELECT 100uF 20% 6.3V
C101	1-163-035-00	s	CERAMIC 0.047uF 50V
C102	1-107-165-00	s	MICA 56PF 5% 500V
C103	1-163-035-00	s	CERAMIC 0.047uF 50V
C104	1-126-163-11	s	ELECT 4.7uF 20% 16V
C105	1-163-035-00	s	CERAMIC 0.047uF 50V
C106	1-163-035-00	s	CERAMIC 0.047uF 50V
C107	1-163-035-00	s	CERAMIC 0.047uF 50V
C108	1-163-035-00	s	CERAMIC 0.047uF 50V
C109	1-163-035-00	s	CERAMIC 0.047uF 50V
C110	1-126-157-11	s	ELECT 10uF 20% 16V
C201	1-163-035-00	s	CERAMIC 0.047uF 50V
C202	1-163-035-00	s	CERAMIC 0.047uF 50V
C203	1-163-035-00	s	CERAMIC 0.047uF 50V
C204	1-163-035-00	s	CERAMIC 0.047uF 50V
C205	1-163-035-00	s	CERAMIC 0.047uF 50V
C206	1-163-035-00	s	CERAMIC 0.047uF 50V
C207	1-163-035-00	s	CERAMIC 0.047uF 50V
C208	1-163-035-00	s	CERAMIC 0.047uF 50V
C209	1-163-035-00	s	CERAMIC 0.047uF 50V
C210	1-163-035-00	s	CERAMIC 0.047uF 50V
C211	1-163-035-00	s	CERAMIC 0.047uF 50V
C212	1-163-035-00	s	CERAMIC 0.047uF 50V
C213	1-163-035-00	s	CERAMIC 0.047uF 50V
C214	1-163-035-00	s	CERAMIC 0.047uF 50V
C215	1-163-035-00	s	CERAMIC 0.047uF 50V
C216	1-163-035-00	s	CERAMIC 0.047uF 50V
C217	1-124-584-00	s	ELECT 100uF 20% 6.3V
C218	1-163-035-00	s	CERAMIC 0.047uF 50V
C219	1-163-035-00	s	CERAMIC 0.047uF 50V
C221	1-163-035-00	s	CERAMIC 0.047uF 50V
C222	1-107-159-00	s	MICA 33PF 5% 500V
C223	1-163-035-00	s	CERAMIC 0.047uF 50V
C224	1-163-035-00	s	CERAMIC 0.047uF 50V
C225	1-163-035-00	s	CERAMIC 0.047uF 50V
C226	1-163-035-00	s	CERAMIC 0.047uF 50V
C227	1-163-035-00	s	CERAMIC 0.047uF 50V
C228	1-163-035-00	s	CERAMIC 0.047uF 50V
C229	1-163-035-00	s	CERAMIC 0.047uF 50V
C230	1-163-035-00	s	CERAMIC 0.047uF 50V
C231	1-163-035-00	s	CERAMIC 0.047uF 50V
C232	1-163-035-00	s	CERAMIC 0.047uF 50V
C233	1-163-035-00	s	CERAMIC 0.047uF 50V
C234	1-163-035-00	s	CERAMIC 0.047uF 50V
C235	1-163-035-00	s	CERAMIC 0.047uF 50V
C236	1-163-035-00	s	CERAMIC 0.047uF 50V
C237	1-124-584-00	s	ELECT 100uF 20% 6.3V
C238	1-163-035-00	s	CERAMIC 0.047uF 50V

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(YC-20 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C239	1-163-035-00	s	CERAMIC 0.047uF 50V
C240	1-163-035-00	s	CERAMIC 0.047uF 50V
C241	1-163-035-00	s	CERAMIC 0.047uF 50V
C242	1-126-157-11	s	ELECT 10uF 20% 16V
C243	1-107-211-00	s	MICA 24PF 5% 500V
C244	1-163-035-00	s	CERAMIC 0.047uF 50V
CN1	1-506-491-11	s	PIN, CONNECTOR 12P
D1	8-719-109-93	s	DIODE RD6.2ES-B2
DL101	1-415-404-11	s	DELAY LINE (BVU) 113mS
DL201	1-415-404-11	s	DELAY LINE (BVU) 113mS
FB101	1-535-178-00	s	RES, FERRITE
FB201	1-535-178-00	s	RES, FERRITE
FB202	1-535-178-00	s	RES, FERRITE
FB203	1-535-178-00	s	RES, FERRITE
FB205	1-535-178-00	s	RES, FERRITE
FB206	1-535-178-00	s	RES, FERRITE
#FL1	1-235-475-12	s	FILTER, LOW PASS
FL201	1-235-476-11	s	FILTER, BAND PASS
IC1	8-743-890-00	s	IC BX389 (SONY)
IC101	8-752-201-30	s	IC CX22013 (SONY)
IC102	8-743-890-00	s	IC BX389 (SONY)
IC201	8-743-890-00	s	IC BX389 (SONY)
IC202	8-743-890-00	s	IC BX389 (SONY)
IC203	8-743-890-00	s	IC BX389 (SONY)
L1	1-408-978-21	s	INDUCTOR 47uH
L2	1-410-979-11	s	INDUCTOR 56uH
L201	1-408-966-21	s	INDUCTOR 4.7uH
Q1	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q2	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q3	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q101	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q102	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q103	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q201	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q202	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q203	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q204	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q205	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q206	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q207	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q208	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q209	8-729-122-63	s	TRANSISTOR 2SA1226
Q210	8-729-122-63	s	TRANSISTOR 2SA1226
Q211	8-729-122-63	s	TRANSISTOR 2SA1226
Q212	8-729-122-63	s	TRANSISTOR 2SA1226
Q213	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q214	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q215	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q216	8-729-122-63	s	TRANSISTOR 2SA1226
Q217	8-729-122-63	s	TRANSISTOR 2SA1226
Q218	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q219	8-729-122-63	s	TRANSISTOR 2SA1226

(YC-20 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q220	8-729-122-63	s	TRANSISTOR 2SA1226
Q221	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q222	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q223	8-729-122-63	s	TRANSISTOR 2SA1226
Q224	8-729-230-49	s	TRANSISTOR 2SC2712-YG
Q225	8-729-230-49	s	TRANSISTOR 2SC2712-YG
R1	1-216-079-00	s	METAL 18K 5% 1/10W
R2	1-216-081-00	s	METAL 22K 5% 1/10W
R3	1-216-025-00	s	METAL 100 5% 1/10W
R4	1-214-558-00	s	METAL 1.1K 1% 1/8W
R5	1-214-550-00	s	METAL 510 1% 1/8W
R6	1-214-557-00	s	METAL 1K 1% 1/8W
R7	1-214-557-00	s	METAL 1K 1% 1/8W
R8	1-214-556-00	s	METAL 910 1% 1/8W
R9	1-214-552-00	s	METAL 620 1% 1/8W
R10	1-214-557-00	s	METAL 1K 1% 1/8W
R11	1-214-556-00	s	METAL 910 1% 1/8W
R12	1-216-049-00	s	METAL 1K 5% 1/10W
R13	1-216-041-00	s	METAL 470 5% 1/10W
R14	1-216-013-00	s	METAL 33 5% 1/10W
R15	1-216-071-00	s	METAL 8.2K 5% 1/10W
R16	1-214-574-00	s	METAL 5.1K 1% 1/8W
R101	1-214-560-00	s	METAL 1.3K 1% 1/8W
R102	1-216-053-00	s	METAL 1.5K 5% 1/10W
R103	1-216-057-00	s	METAL 2.2K 5% 1/10W
R104	1-216-083-00	s	METAL 27K 5% 1/10W
R105	1-216-073-00	s	METAL 10K 5% 1/10W
R106	1-216-069-00	s	METAL 6.8K 5% 1/10W
R107	1-216-065-00	s	METAL 4.7K 5% 1/10W
R108	1-214-541-00	s	METAL 220 1% 1/8W
R109	1-214-541-00	s	METAL 220 1% 1/8W
R110	1-216-057-00	s	METAL 2.2K 5% 1/10W
R111	1-216-073-00	s	METAL 10K 5% 1/10W
R112	1-216-027-00	s	METAL 120 5% 1/10W
R113	1-216-025-00	s	METAL 100 5% 1/10W
R201	1-216-073-00	s	METAL 10K 5% 1/10W
R202	1-216-081-00	s	METAL 22K 5% 1/10W
R203	1-216-041-00	s	METAL 470 5% 1/10W
R204	1-216-041-00	s	METAL 470 5% 1/10W
R205	1-214-541-00	s	METAL 220 1% 1/8W
R206	1-214-541-00	s	METAL 220 1% 1/8W
R207	1-216-059-00	s	METAL 2.7K 5% 1/10W
R208	1-216-081-00	s	METAL 22K 5% 1/10W
R209	1-216-073-00	s	METAL 10K 5% 1/10W
R210	1-216-049-00	s	METAL 1K 5% 1/10W
R211	1-216-049-00	s	METAL 1K 5% 1/10W
R212	1-216-059-00	s	METAL 2.7K 5% 1/10W
R213	1-216-073-00	s	METAL 10K 5% 1/10W
R214	1-216-033-00	s	METAL 220 5% 1/10W
R215	1-216-033-00	s	METAL 220 5% 1/10W
R216	1-216-073-00	s	METAL 10K 5% 1/10W
R217	1-216-063-00	s	METAL 3.9K 5% 1/10W
R218	1-216-017-00	s	METAL 47 5% 1/10W
R219	1-216-063-00	s	METAL 3.9K 5% 1/10W
R220	1-216-017-00	s	METAL 47 5% 1/10W
R221	1-216-063-00	s	METAL 3.9K 5% 1/10W

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(YC-20 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R222	1-216-017-00	s	METAL 47 5% 1/10W
R223	1-216-025-00	s	METAL 100 5% 1/10W
R224	1-216-073-00	s	METAL 10K 5% 1/10W
R225	1-216-073-00	s	METAL 10K 5% 1/10W
R226	1-216-033-00	s	METAL 220 5% 1/10W
R227	1-216-033-00	s	METAL 220 5% 1/10W
R228	1-216-073-00	s	METAL 10K 5% 1/10W
R229	1-216-063-00	s	METAL 3.9K 5% 1/10W
R230	1-216-017-00	s	METAL 47 5% 1/10W
R231	1-216-063-00	s	METAL 3.9K 5% 1/10W
R232	1-216-017-00	s	METAL 47 5% 1/10W
R233	1-216-063-00	s	METAL 3.9K 5% 1/10W
R234	1-216-017-00	s	METAL 47 5% 1/10W
R235	1-216-025-00	s	METAL 100 5% 1/10W
R236	1-216-073-00	s	METAL 10K 5% 1/10W
R237	1-216-049-00	s	METAL 1K 5% 1/10W
R238	1-216-049-00	s	METAL 1K 5% 1/10W
R239	1-216-035-00	s	METAL 270 5% 1/10W
R240	1-216-081-00	s	METAL 22K 5% 1/10W
R241	1-216-073-00	s	METAL 10K 5% 1/10W
R242	1-216-049-00	s	METAL 1K 5% 1/10W
R243	1-216-047-00	s	METAL 820 5% 1/10W
R244	1-216-073-00	s	METAL 10K 5% 1/10W
R245	1-216-033-00	s	METAL 220 5% 1/10W
R246	1-216-033-00	s	METAL 220 5% 1/10W
R247	1-216-073-00	s	METAL 10K 5% 1/10W
R248	1-216-063-00	s	METAL 3.9K 5% 1/10W
R249	1-216-017-00	s	METAL 47 5% 1/10W
R250	1-216-063-00	s	METAL 3.9K 5% 1/10W
R251	1-216-017-00	s	METAL 47 5% 1/10W
R252	1-216-017-00	s	METAL 47 5% 1/10W
R253	1-216-073-00	s	METAL 10K 5% 1/10W
R254	1-216-025-00	s	METAL 100 5% 1/10W
R255	1-216-073-00	s	METAL 10K 5% 1/10W
R256	1-216-073-00	s	METAL 10K 5% 1/10W
R257	1-216-073-00	s	METAL 10K 5% 1/10W
R258	1-216-033-00	s	METAL 220 5% 1/10W
R259	1-216-033-00	s	METAL 220 5% 1/10W
R260	1-216-073-00	s	METAL 10K 5% 1/10W
R261	1-216-063-00	s	METAL 3.9K 5% 1/10W
R262	1-216-017-00	s	METAL 47 5% 1/10W
R263	1-216-063-00	s	METAL 3.9K 5% 1/10W
R264	1-216-017-00	s	METAL 47 5% 1/10W
R265	1-216-017-00	s	METAL 47 5% 1/10W
R266	1-216-073-00	s	METAL 10K 5% 1/10W
R267	1-216-025-00	s	METAL 100 5% 1/10W
R268	1-216-073-00	s	METAL 10K 5% 1/10W
R269	1-216-073-00	s	METAL 10K 5% 1/10W
R270	1-216-049-00	s	METAL 1K 5% 1/10W
R271	1-216-049-00	s	METAL 1K 5% 1/10W
R272	1-216-013-00	s	METAL 33 5% 1/10W
R273	1-216-051-00	s	METAL 1.2K 5% 1/10W
R274	1-214-550-00	s	METAL 510 1% 1/8W
R275	1-214-550-00	s	METAL 510 1% 1/8W
R276	1-216-077-00	s	METAL 15K 5% 1/10W

(YC-20 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R277	1-216-025-00	s	METAL 100 5% 1/10W
R278	1-216-057-00	s	METAL 2.2K 5% 1/10W
R279	1-216-013-00	s	METAL 33 5% 1/10W
R280	1-216-025-00	s	METAL 100 5% 1/10W
R281	1-216-041-00	s	METAL 470 5% 1/10W
R282	1-216-039-00	s	METAL 390 5% 1/10W
R283	1-216-049-00	s	METAL 1K 5% 1/10W
R284	1-216-055-00	s	METAL 1.8K 5% 1/10W
#RV1	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV101	1-230-523-11	s	RES, ADJ, METAL GLAZE 10K
#RV201	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV202	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV203	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV204	1-230-521-11	s	RES, ADJ, METAL GLAZE 2.2K
#RV205	1-230-520-11	s	RES, ADJ, METAL GLAZE 1K
#RV206	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV207	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#RV208	1-230-519-11	s	RES, ADJ, METAL GLAZE 470
#S201	1-570-857-11	s	SWITCH, SLIDE

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
CN1001	1-509-184-51	s	RECEPTACLE XLR 3P(F) “MIC CH-1 IN”
CN1002	1-509-184-51	s	RECEPTACLE XLR 3P(F) “MIC CH-2 IN”
CN1003	1-560-999-11	s	CONNECTOR WITH SW “DC IN”
CN1005	1-561-040-00	s	RECEPTACLE 14P “CAMERA”
CN1006	1-507-251-XX	s	JACK “EARPHONE”
CN1007	1-509-176-51	s	RECEPTACLE XLR 3P(M) “AUDIO CH-1 OUT”
CN1008	1-509-176-51	s	RECEPTACLE XLR 3P(M) “AUDIO CH-2 OUT”
CN1009	1-561-781-11	s	BNC “VIDEO OUT 1”
CN1010	1-561-781-11	s	BNC “VIDEO OUT 2”
CN1011	1-507-195-21	s	JACK “REMOTE”
CN1012	1-561-781-11	s	BNC “LINE VIDEO IN”
CN1013	1-561-781-21	s	BNC “OFF TAPE OUT”
CN1014	1-561-781-21	s	BNC “EXT SC IN”
CN1015	1-561-781-21	s	BNC “TC IN”
CN1016	1-561-781-21	s	BNC “TC OUT”
CN1017	1-507-626-00	s	JACK POWER OUTSIDE “BATT”
H1001	A-6709-509-A	s	DUH-29A-R DRUM ASSY
	A-6709-516-A	s	DUR-29-R UPPER DRUM ASSY
H1002	8-825-578-22	s	EPS264-5803 “CTL R/P AUDIO CH-1 ERASE/AUDIO CH-1/CH-2 R/P”
H1003	8-825-544-20	s	EF248-58 “FULL ERASE”
H1004	8-825-771-31	s	PP295-58 “TIME CODE”
M1001	8-838-079-01	s	DC BHF-1913A “CAPSTAN”
M1002	8-835-123-01	s	DC MNR-7400A “REEL”
M1003	1-541-163-51	s	DC “THREADING”
M1004	8-835-235-01	s	DC MNR-2900B “DRUM”

Note:For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

(FRAME)

Ref. No. or Q'ty	Part No.	SP	Description
ME1001	1-520-482-21	s	AUDIO "CH-1/VIDEO LEVEL/BATTERY" WITH PILOT LAMP
ME1002	1-520-482-11	s	AUDIO "CH-2 LEVEL" WITH PILOT LAMP
PM1001	1-454-386-11	s	SOLENOID, PLUNGER "PINCH"
PM1002	1-454-383-11	s	SOLENOID, PLUNGER "T-BRAKE"
PM1003	1-454-382-11	s	SOLENOID, PLUNGER "TENREG"
PM1004	1-454-383-11	s	SOLENOID, PLUNGER "S-BRAKE"
PM1005	1-454-381-11	s	SOLENOID, PLUNGER "T-IDLER"
PM1006	1-454-381-11	s	SOLENOID, PLUNGER "S-IDLER"
S1001	1-553-246-00	s	TOGGLE, "POWER"
S1002	1-570-028-11	s	MICRO "CASSETTE IN"
S1003	1-570-028-11	s	MICRO "MISS REC"
S1004	1-570-028-21	s	MICRO "CASSETTE LOCK"
S1005	1-570-028-11	s	MICRO "THREAD END"
S1006	1-570-028-11	s	MICRO "EJECT"
S1007	1-570-028-11	s	MICRO "UNTHREAD END"
S1008	1-570-028-21	s	MICRO "SP"
S1009	1-514-459-11	s	SLIDE "DOLBY"
S1010	1-570-028-21	s	MICRO "CASSETTE LOCK"

17-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-6765-908-A	s	HANDLE ASSY
4pcs	7-682-248-09	s	SCREW +K 3X8
2pcs	7-685-136-19	s	SCREW +P 2.6X12 TYPE2 SLIT
2pcs	7-685-233-19	s	SCREW +KTP 2.6X6 TYPE2 SLIT
2pcs	X-3694-703-1	s	KNOB (B) ASSY, VOL
1pc	3-694-787-01	o	INDIVIDUAL CARTON
1pc	3-694-788-01	o	BOX, ACCESSORY
1pc	3-694-785-01	o	CUSHION (UPPER)
1pc	3-694-786-01	o	CUSHION (LOWER)
2pcs	2-249-503-02	o	BELT, SHOULDER
1pc	3-694-789-01	o	CASE, CARRYING
1pc	3-698-917-01	o	BELT, SHOULDER (SINGLE)
1pc	3-701-632-00	s	BAG, POLYETHYLENE (FOR MANUAL)
1pc	4-885-820-01	s	BAG, PROTECTION (FOR BVU-150)

Note: For the # marked in the followig parts list
refer to Section 18 "CHANGED PARTS"

SECTION 18
CHANGED PARTS

NOTE: The numbers identified by making with) are matching with each serial numbers.

504) Serial No.10021 and higher
505) Serial No.10121 and higher
506) Serial No.10191 and higher
508) Serial No.10391 and higher
509) Serial No.10491 and higher
511) Serial No.10541 and higher
601) Serial No.10621 and higher
602) Serial No.10721 and higher
604) Serial No.11231 and higher
607) Serial No.11631 and higher
612) Serial No.11821 and higher
704) Serial No.12181 and higher
706) Serial No.12531 and higher
707) Serial No.12581 and higher
709) Serial No.12781 and higher
710) Serial No.12821 and higher
801) Serial No.13021 and higher
802) Serial No.13171 and higher
803) Serial No.13371 and higher
808) Serial No.14901 and higher
101) Serial No.15341 and higher
103) Serial No.15391 and higher
106) Serial No.15441 and higher
109) Serial No.15521 and higher
204) Serial No.15651 and higher

AU-49A BOARD

OLD)	C1	1-130-483-00	s	FILM 0.01 5% 50V
504)	C1	DELETED.		
OLD)	C117	1-124-233-00	s	ELECT 10 20% 16V
508)	C117	DELETED.		
OLD)	C118	1-130-491-00	s	MYLAR 0.047 5% 50V
506)	C118	1-130-494-11	s	MYLAR 0.082 5% 50V
OLD)	C204	1-130-476-00	s	MYLAR 0.0027 5% 50V
808)	C204	1-130-483-00	s	MYLAR 0.01 5% 50V
OLD)	C217	1-124-233-00	s	ELECT 10 20% 16V
508)	C217	DELETED.		
OLD)	C218	1-130-491-00	s	MYLAR 0.047 5% 50V
506)	C218	1-130-494-11	s	MYLAR 0.082 5% 50V
OLD)	D306	8-719-911-19	s	DIODE 1SS119
511)	D306	DELETED.		
OLD)	D307	8-719-911-19	s	DIODE 1SS119
511)	D307	DELETED.		
OLD)	D324	NOT IN USE.		
511)	D324	8-719-400-18	s	DIODE MA152WK
OLD)	Q105	8-729-901-01	s	TRANSISTOR DTC144EK
508)	Q105	DELETED.		
OLD)	Q205	8-729-901-01	s	TRANSISTOR DTC144EK
508)	Q205	DELETED.		
OLD)	R138	1-216-037-00	s	METAL 10K 5% 1/10W
504)	R138	DELETED.		
OLD)	R140	1-216-037-00	s	METAL 10K 5% 1/10W
504)	R140	1-216-295-00	s	METAL 0 5% 1/10W
OLD)	R142	1-216-077-00	s	METAL 15K 5% 1/10W
803)	R142	1-216-075-00	s	METAL 12K 5% 1/10W
805)	R142	1-216-678-11	s	METAL CHIP 13K 0.5% 1/10W
OLD)	R184	1-216-071-00	s	METAL 8.2K 5% 1/10W
710)	R184	1-216-065-00	s	METAL 4.7K 5% 1/10W
801)	R184	1-216-067-00	s	METAL 5.6K 5% 1/10W
OLD)	R239	1-216-037-00	s	METAL 10K 5% 1/10W
504)	R239	DELETED.		
OLD)	R240	1-216-037-00	s	METAL 10K 5% 1/10W
504)	R240	1-216-295-00	s	METAL 0 5% 1/10W
OLD)	R242	1-216-071-00	s	METAL 8.2K 5% 1/10W
803)	R242	1-216-065-00	s	METAL 4.7K 5% 1/10W
805)	R242	1-216-678-11	s	METAL CHIP 13K 0.5% 1/10W
OLD)	R301	1-216-065-00	s	METAL 4.7K 5% 1/10W
504)	R301	DELETED.		
OLD)	R333	1-216-065-00	s	METAL 4.7K 5% 1/10W
504)	R333	DELETED.		
OLD)	R363	1-216-073-00	s	METAL 10K 5% 1/10W
808)	R363	1-216-053-00	s	METAL 1.5K 5% 1/10W
OLD)	R367	NOT IN USE.		
511)	R367	1-216-029-00	s	METAL 150 5% 1/10W
OLD)	R368	NOT IN USE.		
803)	R368	1-247-847-00	s	CARBON 4.7K 5% 1/6W
OLD)	R369	NOT IN USE.		
803)	R369	1-247-847-00	s	CARBON 4.7K 5% 1/6W
OLD)	RV102	1-228-890-00	s	VAR, METAL 4.7K
204)	RV102	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV103	1-228-891-00	s	VAR, METAL 10K
204)	RV103	1-230-523-11	s	VAR, METAL 10K
OLD)	RV104	1-228-890-00	s	VAR, METAL 4.7K
204)	RV104	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV106	1-228-890-00	s	VAR, METAL 4.7K
204)	RV106	1-320-522-11	s	VAR, METAL 4.7K
OLD)	RV107	1-228-890-00	s	VAR, METAL 4.7K
204)	RV107	1-320-522-11	s	VAR, METAL 4.7K
OLD)	RV108	1-228-889-00	s	VAR, METAL 2.2K
204)	RV108	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV201	1-228-891-00	s	VAR, METAL 10K
204)	RV201	1-230-523-11	s	VAR, METAL 10K
OLD)	RV202	1-228-890-00	s	VAR, METAL 4.7K
204)	RV202	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV203	1-228-891-00	s	VAR, METAL 10K
204)	RV203	1-230-523-11	s	VAR, METAL 10K
OLD)	RV204	1-228-890-00	s	VAR, METAL 4.7K
204)	RV204	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV206	1-228-890-00	s	VAR, METAL 4.7K
204)	RV206	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV207	1-228-890-00	s	VAR, METAL 4.7K
204)	RV207	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV208	1-228-889-00	s	VAR, METAL 2.2K
204)	RV208	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV302	1-228-473-00	s	VAR, METAL 5K
511)	RV302	1-228-394-00	s	VAR, METAL 4.7K
OLD)	RV303	1-228-473-00	s	VAR, METAL 5K
511)	RV303	1-228-394-00	s	VAR, METAL 4.7K

AU-51A BOARD

OLD)	C1	1-161-013-11	s	CERAMIC 0.01 10% 25V
601)	C1	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
OLD)	C307	1-162-541-00	s	CERAMIC CHIP 470PF 5% 100V
601)	C307	1-162-541-11	s	CERAMIC CHIP 470PF 5% 100V
OLD)	C308	1-162-542-00	s	CERAMIC CHIP 680PF 5% 100V
601)	C308	1-162-542-11	s	CERAMIC CHIP 680PF 5% 100V
OLD)	C309	1-162-540-00	s	CERAMIC CHIP 0.0015 5% 100V
601)	C309	1-162-540-11	s	CERAMIC CHIP 0.0015 5% 100V
OLD)	C312	1-102-108-21	s	CERAMIC 150PF 10% 50V
804)	C312	DELETED.		
OLD)	D302	8-719-110-17	s	DIODE RD10ES-B2
801)	D302	8-719-100-58	s	DIODE RD10ES-B3
OLD)	RV101	1-228-895-00	s	VAR, METAL 100K
204)	RV101	1-230-527-11	s	VAR, METAL 100K
OLD)	RV201	1-228-895-00	s	VAR, METAL 100K
204)	RV201	1-230-527-11	s	VAR, METAL 100K
OLD)	RV301	1-228-894-00	s	VAR, METAL 47K
204)	RV301	1-230-526-11	s	VAR, METAL 47K

AU-64 BOARD

OLD)	C120	1-163-035-00	s	CERAMIC CHIP 0.047 50V
504)	C120	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
OLD)	R103	1-216-115-00	s	METAL 560K 5% 1/10W
506)	R103	1-215-487-00	s	METAL 560K 1% 1/4W
OLD)	R106	1-216-103-00	s	METAL 180K 5% 1/10W
506)	R106	1-215-475-00	s	METAL 180K 1% 1/4W
OLD)	R156	1-247-871-00	s	CARBON 47K 5% 1/6W
504)	R156	1-216-089-00	s	METAL 47K 5% 1/10W
OLD)	R157	1-247-871-00	s	CARBON 47K 5% 1/6W
506)	R157	1-216-089-00	s	METAL 47K 5% 1/10W

AU-65 BOARD

OLD)	R203	1-216-115-00	s	METAL 560K 5% 1/10W
506)	R203	1-215-487-00	s	METAL 560K 1% 1/4W
OLD)	R206	1-216-103-00	s	METAL 180K 5% 1/10W
506)	R206	1-215-475-00	s	METAL 180K 1% 1/4W
OLD)	R257	1-247-871-00	s	CARBON 47K 5% 1/6W
506)	R157	1-216-089-00	s	METAL 47K 5% 1/10W

BF-12 BOARD

OLD)	R30	1-247-891-00	s	CARBON 330K 5% 1/6W
504)	R30	1-216-089-00	s	METAL 47K 5% 1/10W
OLD)	R39	1-247-891-00	s	CARBON 330K 5% 1/6W
504)	R39	1-216-089-00	s	METAL 47K 5% 1/10W

CM-19A BOARD

OLD)	C2	1-124-233-00	s	ELECT 10 20% 16V
604)	C2	1-126-162-11	s	ELECT 3.3 20% 50V
OLD)	C3	1-124-233-00	s	ELECT 10 20% 16V
604)	C3	1-126-162-11	s	ELECT 3.3 20% 50V
OLD)	C9	NOT IN USE.		
106)	C9	1-162-199-31	s	CERAMIC 10PF 5% 50V
OLD)	C14	NOT IN USE.		
106)	C14	1-162-199-31	s	CERAMIC 10PF 5% 50V
OLD)	C21	NOT IN USE.		
107)	C21	1-163-227-11	s	CERAMIC CHIP 10PF 0.5PF 50V
OLD)	C52	1-124-462-00	s	ELECT 10 20% 16V
604)	C52	1-126-162-11	s	ELECT 3.3 20% 50V
OLD)	C53	1-124-233-00	s	ELECT 10 20% 16V
604)	C53	1-126-162-11	s	ELECT 3.3 20% 50V
OLD)	C63	NOT IN USE.		
106)	C63	1-162-199-31	s	CERAMIC 10PF 5% 50V
OLD)	C67	NOT IN USE.		
106)	C67	1-162-199-31	s	CERAMIC 10PF 5% 50V
OLD)	C73	NOT IN USE.		
107)	C73	1-163-227-11	s	CERAMIC CHIP 10PF 0.5PF 50V

CR-26 BOARD

OLD)	C28	1-107-211-00	s	MICA 24PF 5% 500V
504)	C28	1-107-049-00	s	MICA 8.2PF 0.5PF 500V
OLD)	C74	NOT IN USE.		
504)	C74	1-161-021-00	s	CERAMIC 0.047 10% 25V
510)	C74	1-163-035-00	s	CERAMIC CHIP 0.047 5% 50V
OLD)	C75	NOT IN USE.		
508)	C75	1-107-209-00	s	MICA 20PF 5% 500V
511)	C75	1-163-100-00	s	CERAMIC CHIP 20PF 5% 50V
OLD)	C76	NOT IN USE.		
511)	C76	1-107-044-00	s	MICA 3.3PF 0.5PF 500V
OLD)	D9	NOT IN USE.		
504)	D9	8-719-911-19	s	DIODE 1SS119
OLD)	Q14	NOT IN USE.		
504)	Q14	8-729-400-76	s	TRANSISTOR 2SD1030
OLD)	R41	1-216-053-00	s	METAL 1.5K 5% 1/10W
504)	R41	1-216-055-00	s	METAL 1.8K 5% 1/10W
OLD)	R96	NOT IN USE.		
506)	R96	1-216-073-00	s	METAL 10K 5% 1/10W
OLD)	R97	NOT IN USE.		
506)	R97	1-216-073-00	s	METAL 10K 5% 1/10W
OLD)	R98	NOT IN USE.		
504)	R98	1-247-855-00	s	CARBON 10K 5% 1/6W
510)	R98	1-216-073-00	s	METAL 10K 5% 1/10W
OLD)	R99	NOT IN USE.		
504)	R99	1-247-863-00	s	CARBON 22K 5% 1/6W
510)	R99	1-216-081-00	s	METAL 22K 5% 1/10W
OLD)	R100	NOT IN USE.		
504)	R100	1-247-855-00	s	CARBON 10K 5% 1/6W
510)	R100	1-216-073-00	s	METAL 10K 5% 1/10W

OLD)	R101	NOT IN USE.		
602)	R101	1-247-831-00	s	CARBON 1K 5% 1/6W
603)	R101	1-216-049-00	s	METAL 1K 5% 1/10W
OLD)	R102	NOT IN USE.		
604)	R102	1-215-428-00	s	METAL 2K 1% 1/6W
OLD)	RV1	1-228-890-00	s	VAR, METAL 4.7K
204)	RV1	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV2	1-228-888-00	s	VAR, METAL 1K
204)	RV2	1-230-520-11	s	VAR, METAL 1K
OLD)	RV3	1-228-891-00	s	VAR, METAL 10
204)	RV3	1-230-523-11	s	VAR, METAL 10K
OLD)	RV4	1-228-892-00	s	VAR, METAL 22K
204)	RV4	1-230-524-11	s	VAR, METAL 22K
OLD)	RV5	1-228-891-00	s	VAR, METAL 10K
204)	RV5	1-230-523-11	s	VAR, METAL 10K
OLD)	RV6	1-228-892-00	s	VAR, METAL 22K
204)	RV6	1-230-524-11	s	VAR, METAL 22K
OLD)	RV7	1-228-891-00	s	VAR, METAL 10K
204)	RV7	1-230-523-11	s	VAR, METAL 10K
OLD)	RV8	1-228-890-00	s	VAR, METAL 4.7K
204)	RV8	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV9	1-228-890-00	s	VAR, METAL 4.7K
204)	RV9	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV10	1-228-894-00	s	VAR, METAL 47K
204)	RV10	1-230-526-11	s	VAR, METAL 47K
OLD)	RV11	1-228-888-00	s	VAR, METAL 1K
204)	RV11	1-230-520-11	s	VAR, METAL 1K
OLD)	RV12	1-228-892-00	s	VAR, METAL 22K
204)	RV12	1-230-524-11	s	VAR, METAL 22K
OLD)	RV13	1-228-889-00	s	VAR, METAL 2200
204)	RV13	1-230-521-11	s	VAR, METAL 2200

KY-86 BOARD

OLD)	1pc	1-806-956-11	s	LIQUID CRYSTAL
511)	1pc	1-807-338-11	s	LIQUID CRYSTAL
OLD)	C3	1-164-323-11	s	CERAMIC CHIP 0.01 10% 100V
506)	C3	DELETED.		
OLD)	C5	1-164-323-11	s	CERAMIC CHIP 0.01 10% 100V
506)	C5	DELETED.		
OLD)	C8	NOT IN USE.		
506)	C8	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
OLD)	C9	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
506)	C9	DELETED.		
OLD)	C10	NOT IN USE.		
506)	C10	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
OLD)	C13	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
506)	C13	DELETED.		
OLD)	C14	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
506)	C14	DELETED.		
OLD)	C16	NOT IN USE.		
506)	C16	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
OLD)	C60	NOT IN USE.		
604)	C60	1-101-005-21	s	CERAMIC 0.022 50V
607)	C60	1-163-037-00	s	CERAMIC 0.022 10% 25V
612)	C60	DELETED.		
OLD)	IC12	8-759-204-40	s	IC TC40H027F(TOSHIBA)
204)	IC12	8-759-925-83	s	IC SN74HC27ANS(TI)
OLD)	IC13	8-759-201-53	s	IC TC40H000F(TOSHIBA)
204)	IC13	8-759-927-46	s	IC SN74HC00ANS(TI)
OLD)	IC14	8-759-201-53	s	IC TC40H000F(TOSHIBA)
204)	IC14	8-759-927-46	s	IC SN74HC00ANS(TI)
OLD)	R2	1-247-855-00	s	CARBON 10K 5% 1/6W
506)	R2	1-216-073-00	s	METAL 10K 5% 1/10W
OLD)	R50	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R50	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R51	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R51	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R52	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R52	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R53	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R53	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R54	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R54	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R55	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R55	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R56	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R56	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R57	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R57	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R58	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R58	1-249-414-11	s	CARBON 560 5% 1/4W
OLD)	R59	1-246-467-25	s	CARBON 560 5% 1/4W
006)	R59	1-249-414-11	s	CARBON 560 5% 1/4W

PA-48 BOARD

OLD)	C706	1-130-485-00	s	MYLAR 0.015 5% 50V
505)	C706	1-130-495-00	s	MYLAR 0.1 5% 50V
508)	C706	1-124-463-00	s	ELECT 0.1 20% 50V
OLD)	C707	NOT IN USE.		
505)	C707	1-126-157-11	s	ELECT 10 20% 16V
OLD)	R717	NOT IN USE.		
508)	R717	1-249-417-11	s	CARBON 1K 5% 1/4W
OLD)	R718	NOT IN USE.		
505)	R718	1-249-441-11	s	CARBON 100K 5% 1/4W

PSB-4 BOARD

OLD)	C7	NOT IN USE.		
505)	C7	1-161-013-00	s	CERAMIC 0.01 10% 25V
509)	C7	1-164-232-11	s	CERAMIC CHIP 0.01 10% 100V
OLD)	C21	1-124-236-00	s	FLECT 47 20% 16V
505)	C21	DELETED.		
OLD)	C22	1-124-236-00	s	FLECT 47 20% 16V
505)	C22	DELETED.		
OLD)	C40	NOT IN USE.		
505)	C40	1-126-768-11	s	ELECT 2200 20% 16V
OLD)	C41	NOT IN USE.		
505)	C41	1-124-360-11	s	ELECT 1000 16V
OLD)	C107	1-163-005-00	s	CERAMIC CHIP 470P 10% 50W

504)	C107	1-163-133-11	s	CERAMIC CHIP 470P 5% 50V
OLD)	D3	8-719-104-34	s	DIODE 1S2835
504)	D3	DELETED.		
505)	D3	8-719-101-32	s	DIODE RD2.7EL1
OLD)	D20	8-719-101-61	s	DIODE RD6.2E-L2
504)	D20	DELETED.		
OLD)	F1	1-532-325-00	s	TIME-LAG
101)	F1	DELETED.		
OLD)	IC102	8-759-103-49	s	IC UPA76HA-F
101)	IC102	8-759-103-48	s	IC UPA74HA-F
OLD)	Q9	8-729-177-43	s	TRANSISTOR 2SD774
504)	Q9	DELETED.		
OLD)	R8	1-216-097-00	s	METAL 100K 5% 1/10W
505)	R8	1-247-839-00	s	CARBON 2.2K 5% 1/6W
509)	R8	1-216-057-00	s	METAL 2.2K 5% 1/10W
OLD)	R60	1-216-067-00	s	METAL 5.6K 5% 1/10W
509)	R60	1-216-059-00	s	METAL 2.7K 5% 1/10W
OLD)	R63	1-216-081-00	s	METAL 22K 5% 1/10W
504)	R63	1-216-075-00	s	METAL 12K 5% 1/10W
OLD)	R64	1-216-089-00	s	METAL 47K 5% 1/10W
504)	R64	1-247-081-00	s	METAL 22K 5% 1/10W
OLD)	R66	1-247-843-00	s	CARBON 3.3K 5% 1/6W
504)	R66	1-247-813-00	s	CARBON 1K 5% 1/6W
506)	R66	1-216-049-00	s	METAL 1K 5% 1/10W
OLD)	R71	1-216-049-00	s	METAL 1K 5% 1/10W
504)	R71	DELETED.		
OLD)	R82	1-216-073-00	s	METAL 10K 5% 1/10W
504)	R82	DELETED.		
OLD)	R123	1-216-117-00	s	METAL 680K 5% 1/10W
504)	R123	1-216-121-00	s	METAL 1M 5% 1/10W
506)	R123	1-216-117-00	s	METAL 680K 5% 1/10W
OLD)	R133	1-215-445-00	s	METAL 10K 1% 1/6W
504)	R133	DELETED.		
505)	R133	1-215-445-00	s	METAL 10K 1% 1/6W
OLD)	R137	1-216-021-00	s	METAL 68 5% 1/10W
504)	R137	DELETED.		
OLD)	R138	1-216-021-00	s	METAL 68 5% 1/10W
504)	R138	DELETED.		
OLD)	R139	1-216-021-00	s	METAL 68 5% 1/10W
504)	R139	DELETED.		
OLD)	RV1	1-228-892-00	s	VAR, METAL 22K
204)	RV1	1-230-524-11	s	VAR, METAL 22K
OLD)	RV2	1-228-890-00	s	VAR, METAL 4.7K
204)	RV2	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV3	1-228-888-00	s	VAR, METAL 1K
204)	RV3	1-230-520-11	s	VAR, METAL 1K
OLD)	RV4	1-228-888-00	s	VAR, METAL 1K
204)	RV4	1-230-520-11	s	VAR, METAL 1K
OLD)	RV6	1-228-891-00	s	VAR, METAL 10K
204)	RV6	1-230-523-11	s	VAR, METAL 10K
OLD)	RV102	1-228-888-00	s	VAR, METAL 1K
204)	RV102	1-230-520-11	s	VAR, METAL 1K

RP-24 BOARD

OLD)	C10	1-163-038-00	s	CERAMIC CHIP 0.1 25V
505)	C10	1-124-228-11	s	ELECT 22 20% 10V
OLD)	C13	1-163-038-00	s	CERAMIC CHIP 0.1 25V
505)	C13	1-124-228-11	s	ELECT 22 20% 10V
OLD)	RV1	1-228-889-00	s	VAR, METAL 2.2K
204)	RV1	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV2	1-228-889-00	s	VAR, METAL 2.2K
204)	RV2	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV3	1-228-890-00	s	VAR, METAL 4.7K
509)	RV3	1-228-889-00	s	VAR, METAL 2.2K
204)	RV3	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV4	1-228-890-00	s	VAR, METAL 4.7K
509)	RV4	1-228-889-00	s	VAR, METAL 2.2K
204)	RV4	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV5	1-228-889-00	s	VAR, METAL 2.2K
204)	RV5	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV7	1-228-889-00	s	VAR, METAL 2.2K
204)	RV7	1-230-521-11	s	VAR, METAL 2.2K

SV-57 BOARD

OLD)	C23	1-163-037-11	s	CERAMIC CHIP 0.022 10% 25V
612)	C23	1-161-474-00	s	CERAMIC 0.022 10% 50V
OLD)	C26	1-130-484-00	s	MYLAR 0.012 5% 50V
504)	C26	1-130-481-00	s	MYLAR 0.0068 5% 50V
OLD)	C46	1-124-255-00	s	ELECT 1 20% 50V
504)	C46	1-130-489-11	s	MYLAR 0.033 5% 50V
OLD)	C51	1-130-497-00	s	MYLAR 0.15 5% 50V
601)	C51	1-130-486-00	s	MYLAR 0.018 5% 50V
OLD)	C112	1-163-003-00	s	CERAMIC CHIP 330PF 10% 50V
504)	C112	DELETED.		
OLD)	C130	NOT IN USE.		
601)	C130	1-130-486-00	s	MYLAR 0.018 5% 50V
OLD)	D42	NOT IN USE.		
504)	D42	8-719-100-05	s	DIODE MA152WK
OLD)	D44	NOT IN USE.		
504)	D44	8-719-104-34	s	DIODE 1S2836
OLD)	D45	NOT IN USE.		
709)	D45	8-719-911-19	s	DIODE 1SS119
OLD)	IC1	8-751-941-04	s	IC CX194B (SONY)
803)	IC1	8-751-941-05	s	IC CX194B-5 (SONY)
OLD)	Q17	8-729-202-62	s	TRANSISTOR 2SD1221
601)	Q17	8-729-206-55	s	TRANSISTOR 2SC3072-B
OLD)	Q19	8-729-202-62	s	TRANSISTOR 2SD1221
601)	Q19	8-729-206-55	s	TRANSISTOR 2SC3072-B
OLD)	Q34	8-729-202-62	s	TRANSISTOR 2SD1221
601)	Q34	8-729-206-55	s	TRANSISTOR 2SC3072-B
OLD)	Q36	8-729-202-62	s	TRANSISTOR 2SD1221
601)	Q36	8-729-206-55	s	TRANSISTOR 2SC3072-B
OLD)	Q54	8-729-216-22	s	TRANSISTOR 2SA1162-G
504)	Q54	DELETED.		

OLD)	R27	1-216-069-00	s	METAL 6.8K 5% 1/10W
504)	R27	1-216-065-00	s	METAL 4.7K 5% 1/10W
OLD)	R28	1-216-081-00	s	METAL 22K 5% 1/10W
504)	R28	1-216-079-00	s	METAL 18K 5% 1/10W
OLD)	R73	1-216-105-00	s	METAL 220K 5% 1/10W
504)	R73	1-216-483-00	s	METAL 390K 1% 1/4W
OLD)	R86	1-247-881-00	s	CARBON 120K 5% 1/6W
601)	R86	1-247-903-00	s	CARBON 1M 5% 1/6W
607)	R86	1-247-895-00	s	CARBON 470K 5% 1/6W
OLD)	R132	1-216-121-00	s	METAL 1M 5% 1/10W
504)	R132	1-216-177-00	s	METAL 680K 5% 1/10W
OLD)	R201	1-216-105-00	s	METAL 220K 5% 1/10W
807)	R201	1-216-104-00	s	METAL 200K 5% 1/10W
OLD)	R206	1-216-089-00	s	METAL 47K 5% 1/10W
807)	R206	1-216-093-00	s	METAL 68K 5% 1/10W
OLD)	R211	1-216-121-00	s	METAL 1M 5% 1/10W
504)	R211	DELETED.		
OLD)	R249	1-216-083-00	s	METAL 27K 5% 1/10W
806)	R249	1-216-081-00	s	METAL 22K 5% 1/10W
OLD)	R271	1-216-033-00	s	METAL 220 5% 1/10W
504)	R271	1-216-035-00	s	METAL 270 5% 1/10W
OLD)	R282	NOT IN USE.		
504)	R282	1-216-101-00	s	METAL 150K 5% 1/10W
OLD)	R283	NOT IN USE.		
504)	R283	1-216-295-00	s	METAL 0 5% 1/10W
OLD)	R300	NOT IN USE.		
601)	R300	1-247-903-00	s	CARBON 1M 5% 1/6W
602)	R300	1-216-121-00	s	METAL 1M 5% 1/10W
OLD)	R301	NOT IN USE.		
709)	R301	1-249-425-11	s	CARBON 4.7K 5% 1/4W
OLD)	RV1	1-228-895-00	s	VAR, METAL 100K
204)	RV1	1-230-527-11	s	VAR, METAL 100K
OLD)	RV2	1-228-894-00	s	VAR, METAL 47K
204)	RV2	1-230-526-11	s	VAR, METAL 47K
OLD)	RV3	1-228-895-00	s	VAR, METAL 100K
204)	RV3	1-230-527-11	s	VAR, METAL 100K
OLD)	RV4	1-228-894-00	s	VAR, METAL 47K
204)	RV4	1-230-526-11	s	VAR, METAL 47K
OLD)	RV5	1-228-895-00	s	VAR, METAL 100K
204)	RV5	1-230-527-11	s	VAR, METAL 100K
OLD)	RV6	1-228-897-00	s	VAR, METAL 470K
204)	RV6	1-230-529-11	s	VAR, METAL 470K
OLD)	RV7	1-228-894-00	s	VAR, METAL 47K
204)	RV7	1-230-526-11	s	VAR, METAL 47K
OLD)	RV8	1-228-897-00	s	VAR, METAL 470K
204)	RV8	1-230-529-11	s	VAR, METAL 470K
OLD)	RV9	1-228-890-00	s	VAR, METAL 4.7K
204)	RV9	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV10	1-228-888-00	s	VAR, METAL 1K
204)	RV10	1-230-520-11	s	VAR, METAL 1K
OLD)	RV11	1-228-894-00	s	VAR, METAL 47K
204)	RV11	1-230-526-11	s	VAR, METAL 47K
OLD)	RV12	1-228-891-00	s	VAR, METAL 10K
204)	RV12	1-230-523-11	s	VAR, METAL 10K
OLD)	RV13	1-228-895-00	s	VAR, METAL 100K
204)	RV13	1-230-527-11	s	VAR, METAL 100K
OLD)	RV14	1-228-896-00	s	VAR, METAL 220K
204)	RV14	1-230-528-11	s	VAR, METAL 220K

SY-18C BOARD

OLD)	C62	1-161-059-00	s	CERAMIC 0.047 50V
602)	C62	1-163-035-00	s	CERAMIC CHIP 0.047 50V
OLD)	CN122	1-564-002-00	s	PIN, CONNECTOR 3P
505)	CN122	DELETED.		
OLD)	X1	1-567-145-00	s	OSC. CRYSTAL 3.579545MHz
109)	X1	1-567-859-11	s	OSC. CRYSTAL 3.579545MHz
OLD)	X2	1-527-822-00	s	OSC. CERAMIC 4.0MHz
607)	X2	1-567-192-11	s	OSC. CERAMIC 4.0MHz

SY-22A BOARD

OLD)	C21	1-131-345-00	s	TANTALUM 0.47 10% 35V
505)	C21	1-131-343-00	s	TANTALUM 0.22 10% 35V
OLD)	R61	NOT IN USE.		
509)	R61	1-216-079-00	s	METAL 18K 5% 1/10W
OLD)	R68	1-216-057-00	s	METAL 2.2K 5% 1/10W
505)	R68	1-216-069-00	s	METAL 6.8K 5% 1/10W

SY-23 BOARD

OLD)	D22	NOT IN USE.		
706)	D22	8-719-911-19	s	DIODE 1SS119

VA-29 BOARD

OLD)	R57	NOT IN USE.		
504)	R57	1-247-855-00	s	CARBON 10K 5% 1/6W
508)	R57	1-216-073-00	s	METAL 10K 5% 1/10W
OLD)	RV1	1-228-308-00	s	VAR, CERAMIC 10K
504)	RV1	1-224-474-00	s	VAR, METAL 10K
OLD)	RV2	1-228-305-00	s	VAR, CERAMIC 1K
504)	RV2	1-228-471-00	s	VAR, METAL 1K
OLD)	RV3	1-228-305-00	s	VAR, CERAMIC 1K
504)	RV3	1-228-471-00	s	VAR, METAL 1K
OLD)	RV4	1-228-305-00	s	VAR, CERAMIC 1K
504)	RV4	1-228-471-00	s	VAR, METAL 1K

VO-12 BOARD

OLD)	C107	1-107-206-00	s	MICA 15PF 5% 500V
508)	C107	1-107-207-00	s	MICA 16PF 5% 500V
OLD)	C117	1-124-233-00	s	ELECT 10 20% 16V
701)	C117	1-131-365-00	s	TANTALUM 10 20% 20V
OLD)	C139	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
508)	C139	DELETED.		
OLD)	C273	NOT IN USE.		
506)	C273	1-107-202-00	s	MICA 10PF 5% 500V
OLD)	C332	1-161-059-00	s	CERAMIC 0.047 20% 50V
506)	C332	1-163-035-00	s	CERAMIC CHIP 0.047 50V
OLD)	C333	1-123-332-00	s	ELECT 47 20% 16V
506)	C333	1-124-589-11	s	ELECT 47 20% 16V
OLD)	C334	NOT IN USE.		
504)	C334	1-107-211-00	s	MICA 24PF 5% 500V
OLD)	C413	1-130-474-00	s	MYLAR 0.0018 5% 50V
506)	C413	DELETED.		
OLD)	C420	1-163-035-00	s	CERAMIC CHIP 0.047 50V
504)	C420	1-161-059-00	s	CERAMIC 0.047 10% 50V
506)	C420	1-163-035-00	s	CERAMIC CHIP 0.047 50V
OLD)	C444	1-124-233-00	s	ELECT 10 20% 16V
506)	C444	1-126-157-11	s	ELECT 10 20% 16V
OLD)	C512	1-126-157-11	s	ELECT 10 20% 16V
801)	C512	DELETED.		
OLD)	C513	1-126-157-11	s	ELECT 10 20% 16V
801)	C513	DELETED.		
OLD)	C514	1-126-157-11	s	ELECT 10 20% 16V
801)	C514	DELETED.		
OLD)	C515	1-124-251-00	s	ELECT 0.22 20% 50V
801)	C515	DELETED.		
OLD)	CN19	1-562-957-11	o	CONNECTOR 10P
504)	CN619	1-562-957-11	o	CONNECTOR 10P
OLD)	CN22	1-562-482-11	o	CONNECTOR 20P
504)	CN622	1-562-482-11	o	CONNECTOR 20P
OLD)	CN23	1-564-680-11	o	CONNECTOR 10P
504)	CN623	1-564-680-11	o	CONNECTOR 10P
OLD)	CN24	1-564-680-11	o	CONNECTOR 10P
504)	CN624	1-564-680-11	o	CONNECTOR 10P
OLD)	CN25	1-564-680-11	o	CONNECTOR 10P
504)	CN625	1-564-680-11	o	CONNECTOR 10P
OLD)	CN26	1-564-680-11	o	CONNECTOR 10P
504)	CN626	1-564-680-11	o	CONNECTOR 10P
OLD)	CN27	1-564-318-00	o	BOARD TO BOARD, CONNECTOR 10P
504)	CN627	1-566-095-11	o	BOARD TO BOARD, CONNECTOR 10P
OLD)	CN628	NOT IN USE.		
612)	CN628	1-564-001-00	s	CONNECTOR 2P
OLD)	CV301	1-141-246-00	s	TRIMMER
103)	CV301	1-141-407-11	s	CERAMIC TRIMMER
OLD)	CV302	1-141-246-00	s	TRIMMER
103)	CV302	1-141-407-11	s	CERAMIC TRIMMER
OLD)	D202	NOT IN USE.		
506)	D202	8-719-911-19	s	DIODE 1SS119
OLD)	FL103	NOT IN USE.		
506)	FL103	1-409-410-11	s	TRAP FILTER 4.43MHz
OLD)	IC503	8-759-145-58	s	IC uPC4558C(NEC)
801)	IC503	DELETED.		
OLD)	L4	1-407-169-00	s	INDUCTOR 100uH
504)	L4	1-407-161-00	s	INDUCTOR 22uH
506)	L4	1-421-329-00	s	INDUCTOR CHOKE
OLD)	L103	1-407-167-00	s	INDUCTOR 68uH
508)	L103	1-408-981-21	s	INDUCTOR 82uH
OLD)	L108	1-407-171-00	s	INDUCTOR 150uH
508)	L108	DELETED.		
OLD)	L405	1-407-163-00	s	INDUCTOR 33uH
504)	L405	DELETED.		
OLD)	L406	1-407-163-00	s	INDUCTOR 33uH
504)	L406	DELETED.		
OLD)	Q52	NOT IN USE.		
506)	Q52	8-729-271-23	s	TRANSISTOR 2SC2712
OLD)	Q125	NOT IN USE.		
508)	Q125	8-729-230-49	s	TRANSISTOR 2SC2712-YG
OLD)	Q191	NOT IN USE.		
612)	Q191	8-729-901-01	s	TRANSISTOR DTC144EK
OLD)	Q210	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
504)	Q210	DELETED.		
OLD)	Q213	NOT IN USE.		
506)	Q213	8-729-400-76	s	TRANSISTOR 2SD1030
OLD)	Q215	NOT IN USE.		
508)	Q215	8-729-400-76	s	TRANSISTOR 2SD1030
OLD)	Q502	8-729-400-76	s	TRANSISTOR 2SD1030
801)	Q502	DELETED.		
OLD)	Q503	8-729-231-55	s	TRANSISTOR 2SC2878-B
801)	Q503	DELETED.		
OLD)	R15	1-216-067-00	s	METAL 5.6K 5% 1/10W
504)	R15	1-216-071-00	s	METAL 8.2K 5% 1/10W
OLD)	R37	NO IN USE.		
506)	R37	1-216-073-00	s	METAL 10K 5% 1/10W
OLD)	R38	NO IN USE.		
506)	R38	1-216-017-00	s	METAL 47 5% 1/10W
OLD)	R107	1-216-045-00	s	METAL 680 5% 1/10W
508)	R107	1-216-025-00	s	METAL 100 5% 1/10W
707)	R107	1-216-026-00	s	METAL 110 5% 1/10W
OLD)	R108	1-216-045-00	s	ELECT 680 5% 1/10W
707)	R108	1-216-046-00	s	ELECT 750 5% 1/10W
OLD)	R110	1-216-057-00	s	ELECT 2.2K 5% 1/10W
707)	R110	1-216-058-00	s	ELECT 2.4K 5% 1/10W
OLD)	R151	1-216-053-00	s	METAL 1.5K 5% 1/10W
506)	R151	1-216-047-00	s	METAL 820 5% 1/10W
OLD)	R165	1-216-075-00	s	METAL 12K 5% 1/10W
504)	R165	1-216-073-00	s	METAL 10K 5% 1/10W
OLD)	R166	1-216-073-00	s	METAL 10K 5% 1/10W
504)	R166	1-216-075-00	s	METAL 12K 5% 1/10W
OLD)	R179	NO IN USE.		
508)	R179	1-216-049-00	s	METAL 1K 5% 1/10W
OLD)	R180	NO IN USE.		
508)	R180	1-216-057-00	s	METAL 2.2K 5% 1/10W
OLD)	R225	1-215-416-00	s	METAL 620 1% 1/6W
504)	R225	DELETED.		
OLD)	R226	1-215-413-00	s	METAL 470 1% 1/6W
504)	R226	DELETED.		
508)	R226	1-215-422-00	s	METAL 1.1K 1% 1/6W
OLD)	R245	1-216-061-00	s	METAL 3.3K 5% 1/10W
504)	R245	1-216-043-00	s	METAL 560 5% 1/10W
OLD)	R252	1-247-825-00	s	CARBON 560 5% 1/6W
504)	R252	DELETED.		
OLD)	R253	NO IN USE.		
506)	R253	1-216-081-00	s	METAL 22K 5% 1/10W
508)	R253	DELETED.		

OLD)	R254	NO IN USE.		
508)	R254	1-216-081-00	s	METAL 22K 5% 1/10W
OLD)	R255	NO IN USE.		
508)	R255	1-216-081-00	s	METAL 22K 5% 1/10W
OLD)	R325	1-216-091-00	s	METAL 56K 5% 1/10W
511)	R325	1-216-089-00	s	METAL 47K 1% 1/10W
OLD)	R335	NOT IN USE.		
511)	R335	1-216-065-00	s	METAL 4.7K 5% 1/10W
OLD)	R412	1-215-429-00	s	METAL 2.2K 1% 1/6W
506)	R412	1-215-431-00	s	METAL 2.7K 1% 1/6W
OLD)	R420	1-216-049-00	s	METAL 1K 5% 1/10W
504)	R420	1-216-295-00	s	METAL 0 5% 1/10W
506)	R420	DELETED.		
OLD)	R441	1-216-061-00	s	METAL 3.3K 5% 1/10W
504)	R441	DELETED.		
OLD)	R452	1-247-819-00	s	CARBON 330 5% 1/6W
506)	R452	1-216-037-00	s	METAL 330 5% 1/10W
OLD)	R453	NOT IN USE.		
504)	R453	1-247-815-00	s	CARBON 220 5% 1/6W
506)	R453	1-216-033-00	s	METAL 220 5% 1/10W
OLD)	R454	NOT IN USE.		
504)	R454	1-247-845-00	s	CARBON 3.9 5% 1/6W
506)	R454	1-216-063-00	s	METAL 3.9K 5% 1/10W
OLD)	R455	NOT IN USE.		
504)	R455	1-247-831-00	s	CARBON 1 5% 1/6W
506)	R455	1-216-049-00	s	METAL 1K 5% 1/10W
OLD)	R510	1-216-089-00	s	METAL 47K 5% 1/10W
804)	R510	1-216-081-00	s	METAL 22K 5% 1/10W
OLD)	R514	1-216-073-00	s	METAL 10K 5% 1/10W
801)	R514	DELETED.		
OLD)	R515	1-216-073-00	s	METAL 10K 5% 1/10W
801)	R515	DELETED.		
OLD)	R516	1-216-097-00	s	METAL 100K 5% 1/10W
801)	R516	DELETED.		
OLD)	R517	1-216-085-00	s	METAL 33K 5% 1/10W
801)	R517	DELETED.		
OLD)	R518	1-216-085-00	s	METAL 33K 5% 1/10W
801)	R518	DELETED.		
OLD)	R519	1-216-089-00	s	METAL 47K 5% 1/10W
801)	R519	DELETED.		
OLD)	R520	1-216-081-00	s	METAL 22K 5% 1/10W
801)	R520	DELETED.		
OLD)	R521	1-216-097-00	s	METAL 100K 5% 1/10W
801)	R521	DELETED.		
OLD)	R522	1-216-049-00	s	METAL 1K 5% 1/10W
801)	R522	DELETED.		
OLD)	R523	1-216-067-00	s	METAL 5.6K 5% 1/10W
801)	R523	DELETED.		
OLD)	RV1	1-228-890-00	s	VAR, METAL 4.7K
204)	RV1	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV51	1-228-888-00	s	VAR, METAL 1K
204)	RV51	1-230-520-11	s	VAR, METAL 1K
OLD)	RV101	1-228-891-00	s	VAR, METAL 10K
204)	RV101	1-230-523-00	s	VAR, METAL 10K
OLD)	RV102	1-228-892-00	s	VAR, METAL 22K
204)	RV102	1-230-524-11	s	VAR, METAL 22K
OLD)	RV103	1-228-888-00	s	VAR, METAL 1K
204)	RV103	1-230-520-11	s	VAR, METAL 1K
OLD)	RV104	1-228-888-00	s	VAR, METAL 1K
204)	RV104	1-230-520-11	s	VAR, METAL 1K

OLD)	RV105	1-228-888-00	s	VAR, METAL 1K
204)	RV105	1-230-520-11	s	VAR, METAL 1K
OLD)	RV106	1-228-890-00	s	VAR, METAL 4.7K
204)	RV106	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV107	1-228-896-00	s	VAR, METAL 220K
204)	RV107	1-230-528-11	s	VAR, METAL 220K
OLD)	RV108	1-228-890-00	s	VAR, METAL 4.7K
204)	RV108	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV109	1-228-890-00	s	VAR, METAL 4.7K
204)	RV109	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV110	1-228-892-00	s	VAR, METAL 22K
204)	RV110	1-230-524-11	s	VAR, METAL 22K
OLD)	RV111	1-228-887-00	s	VAR, METAL 470K
204)	RV111	1-230-519-11	s	VAR, METAL 470K
OLD)	RV201	1-228-887-00	s	VAR, METAL 470K
204)	RV201	1-230-519-11	s	VAR, METAL 470K
OLD)	RV202	1-228-887-00	s	VAR, METAL 470K
204)	RV202	1-230-519-11	s	VAR, METAL 470K
OLD)	RV203	1-228-888-00	s	VAR, METAL 1K
204)	RV203	1-230-520-11	s	VAR, METAL 1K
OLD)	RV204	1-228-888-00	s	VAR, METAL 1K
204)	RV204	1-230-520-11	s	VAR, METAL 1K
OLD)	RV205	1-228-892-00	s	VAR, METAL 22K
204)	RV205	1-230-524-11	s	VAR, METAL 22K
OLD)	RV206	1-228-888-00	s	VAR, METAL 1K
204)	RV206	1-230-520-11	s	VAR, METAL 1K
OLD)	RV207	1-228-888-00	s	VAR, METAL 1K
204)	RV207	1-230-520-11	s	VAR, METAL 1K
OLD)	RV208	NOT IN USE.		
504)	RV208	1-228-456-00	s	VAR, CERAMIC 1K
508)	RV208	1-228-890-00	s	VAR, METAL 4.7K
204)	RV208	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV301	1-228-888-00	s	VAR, METAL 1K
204)	RV301	1-230-520-11	s	VAR, METAL 1K
OLD)	RV304	1-228-890-00	s	VAR, METAL 4.7K
204)	RV304	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV305	1-228-890-00	s	VAR, METAL 4.7K
204)	RV305	1-230-522-11	s	VAR, METAL 4.7K
OLD)	RV306	1-228-889-00	s	VAR, METAL 2.2K
204)	RV306	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV307	1-228-889-00	s	VAR, METAL 2.2K
204)	RV307	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV401	1-228-890-11	s	VAR, METAL 4.7K
204)	RV401	1-230-522-00	s	VAR, METAL 4.7K
OLD)	RV402	1-228-890-11	s	VAR, METAL 4.7K
204)	RV402	1-230-522-00	s	VAR, METAL 4.7K
OLD)	RV501	1-228-895-00	s	VAR, METAL 100K
204)	RV501	1-230-527-11	s	VAR, METAL 100K
OLD)	RV502	1-228-888-00	s	VAR, METAL 1K
204)	RV502	1-230-520-11	s	VAR, METAL 1K
OLD)	RV503	1-228-889-00	s	VAR, METAL 2.2K
801)	RV503	DELETED.		
OLD)	RV504	1-228-890-00	s	VAR, METAL 4.7K
204)	RV504	1-230-522-11	s	VAR, METAL 4.7K
OLD)	SW1	1-552-509-00	s	DIP" CONVENTIONAL/SP"
505)	S201	1-552-509-00	s	DIP" CONVENTIONAL/SP"

YC-20 BOARD

OLD)	FL1	1-235-475-11	s	LOW PASS
802)	FL1	1-235-475-12	s	LOW PASS
OLD)	RV1	1-228-887-00	s	VAR, METAL 470
511)	RV1	1-228-888-00	s	VAR, METAL 1K
204)	RV1	1-230-520-00	s	VAR, METAL 1K
OLD)	RV101	1-228-891-00	s	VAR, METAL 10K

204)	RV101	1-230-523-11	s	VAR, METAL 10K
OLD)	RV201	1-228-887-00	s	VAR, METAL 470
204)	RV201	1-230-519-11	s	VAR, METAL 470
OLD)	RV202	1-228-887-00	s	VAR, METAL 470
204)	RV202	1-230-519-11	s	VAR, METAL 470
OLD)	RV203	1-228-887-00	s	VAR, METAL 470

204)	RV203	1-230-519-11	s	VAR, METAL 470
OLD)	RV204	1-228-889-00	s	VAR, METAL 2.2K
204)	RV204	1-230-521-11	s	VAR, METAL 2.2K
OLD)	RV205	1-228-888-00	s	VAR, METAL 1K
204)	RV205	1-230-520-11	s	VAR, METAL 1K
OLD)	RV206	1-228-887-00	s	VAR, METAL 470

204)	RV206	1-230-519-11	s	VAR, METAL 470
OLD)	RV207	1-228-887-00	s	VAR, METAL 470
204)	RV207	1-230-519-11	s	VAR, METAL 470
OLD)	RV208	1-228-887-00	s	VAR, METAL 470
204)	RV208	1-230-519-11	s	VAR, METAL 470
OLD)	S201	1-554-076-11	s	VAR, SLIDE "PROCESS"
204)	S201	1-570-857-11	s	VAR, SLIDE "PROCESS"

FRAME

OLD)	S1010	NOT IN USE.		
504)	S1010	1-570-028-21	s	MICRO "CASSETTE LOCK"